THE IRON TRADE REVIEW

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GOOD EFFECTS

EXPECTED TO FOLLOW ABSORPTION OF TENNESSEE COMPANY.

Record Breaking Production of Some Mills.—Large Blast Furnace Output.—Heavy Ore Shipments.—Market Dull.

The absorption of the Tennessee Coal, Iron & Railroad Co. by the United States Steel Corporation, clearly foreshadowed by events which have occurred in New York this week, will, it is believed, have a good influence on the southern pig iron market. If the Tennessee company should continue as in the past to sell about half of its product of pig iron, its conservative influence would tend to add firmness to the market, and if, as may be the case, the furnaces of the company should be used for making steel making iron, the withdrawal of the large tonnage hitherto sold would strengthen the position of producers. The Republic Iron & Steel Co., although controlled to a large extent by the interests which have dominated the Tennessee concern, is not involved in the recent deal, and whether it will be eventually taken over time alone can tell.

Blast Furnace Production

Our blast furnace statistics for October show a continuance of heavy production, the total for the month being 2,352,530 tons, compared with 2,174,148 tons in September, or a daily production of 75,888 tons in October, compared with 72,471 tons in September. A considerable number of furnaces were blown out in the last few days of last month and the first week of this month, and it is certain that the production for November will show a sharp curtailment.

Heavy Ore Shipments

October made a new record for that month in ore shipments, the total being 6,482,654 tons, an increase of 1,401,860 tons compared with October of last year. The shipments to date are within half a million tons of the entire season's shipments last year, being 37,041,861 tons, and indications are that the shipments this season will amount to 41,000,000 tons.

Bessemer Deliveries

Dullness continues in the pig iron market, and the valley price of Bessemer has declined $1 per ton. There is so little actual business in foundry grades that the market has not been tested, but it is believed that $17 Birmingham could be easily shaded on a good tonnage, and that quotations on northern brands would also be reduced if such reduction would take orders.

Very Large Production

In spite of the dullness of the market, the production of finishing mills has continued at a record-breaking rate in numerous plants, the production of the Illinois Steel Co. being especially noteworthy, while the output of the American Bridge Co. has made a new record, being over 60,000 tons, of which only about one-third was sold. Signs of weakness in some finished products, especially steel bars and plates, have been accompanied by declarations of the determination of manufacturers not to reduce prices, and it is probable that very few concessions will be made on these products. Bar iron is weak, but in the central west efforts are being made to support the market, and with some success. Cast iron pipe is quoted at $1 per ton lower. Some buyers of wire products are asking for delay of deliveries, but business is still very good.

SOUTHERN FIELD

WILL BE ENTERED BY THE U. S. STEEL CORPORATION.

Stock of Tennessee Coal, Iron & Railroad Co. at Par Will be Exchanged for Bonds.—Judge Gary Issues a Statement.

(Special Telegram.)

New York, N. Y., Nov. 6.—Relative to Tennessee Coal, Iron & R. R. Co. deal, Judge Gary has given out this statement:

"The United States Steel Corporation has been negotiating for the purchase of a majority of the stock of the Tennessee company at par. The same price will be paid for all additional stock offered within 15 days. The contract has been made by the finance committee of the Corporation subject to formal ratification by the board of directors, Wednesday afternoon. The acquisition of this property by the Corporation will increase its steel making capacity by about 2½ per cent, making its capacity about 60 per cent of the total production in the United States. It is believed the purchase will eventually be of great benefit to the Corporation and the steel industry."

The terms of the deal are generally understood to involve the transfer of about $15,000,000 in stock, or slightly more than half that outstanding. In exchange, at equal valuation, will be given second mortgage five per cent bonds of the Corporation now held in its treasury. The deal, so far as the syndicate holdings are concerned, is merely a transfer of securities. It is understood that certain members of the pool will retain their holdings.

The Negotiations.

New York, Nov. 5.—Interests closely allied with the United States Steel Corporation have acquired a controlling interest in the Tennessee Coal, Iron & Railroad Co. through the purchase of a large part of the stock held by a syndicate of stockholders representing about five-sixths of the outstanding stock.

Reports in financial circles connect the transfer of control with the vigorous measures under way for

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THE WEEK IN IRON CENTERS

PITTSBURG.

Bessemer Pig Weaker—Readjustment to New Conditions in Progress.

Office of THE IRON TRADE REVIEW,
521 Park Bldg., Nov. 5.

The market, during the past week, has been dragging along without any great deviation from conditions of a week ago. Prices have been holding up all along the line with the exception of semi-finished and raw material. The demand for deliveries on existing contracts has been fair except in the heavy finished lines and raw material.

The readjustment to the new conditions is on in full force and a peculiar circumstance is that with comparatively no new buying being done many of the finishing mills are running to full capacity and during October, which is usually the record tonnage month of the year, a score of production records were broken by both the leading interest and independent concerns. In October, 1906, the Carnegie Steel Co. broke 21 production records, while last month 15 records were broken, several of them the high mark records of last year.

The Carnegie Steel Co. at the end of last week had 17 blast furnaces out, an increase of three over the previous week. It is stated that all of these furnaces were in a condition that an early shut-down for repairs would be necessary and advantage is being taken of the situation to put them back into shape and ready for continued operation when their product is more needed than at present. It is also stated that it is not the intention of the leading interest to blow out any additional furnaces at this time, although as fast as repairs are made on those now out, they may be resumed and others blown out, keeping the number about the same. Atlanta furnace of Republic Iron & Steel Co., at New Castle, has been banked and a still further curtailment of blast furnace production is being considered by this company. Old No. 2 of the Shenango Furnace Co., at Sharpsville is out and on account of market conditions work on the new No. 2 of the same company is not being pushed.

The Columbus furnaces and sheet bar mill of the leading interest, as stated last week, have been shut down and the Bellaire plant, with a similar equipment, was closed last Saturday night. Both of these mills made sheet bars and the falling off of the tin plate business is given as the cause of the two suspensions.

Credits are being carefully watched and in several instances shipments have been withheld and the big interests have adopted a policy of not urging customers to take out material when there is any doubt about ability to handle it. On the contrary, consumers have been advised to go cautiously in this regard.

There is no disposition on the part of buyers to contract for requirements beyond the first of the year and careful investigation develops the fact that on semi-finished material most of them are pretty well covered up to that time. Reports have been in circulation to the effect that an effort to revive the billet pool of several years ago are again being made and that a meeting was held in this city last Wednesday. All independent interests deny positively that there has been a conference on the subject, but this may be taken with a little skepticism in view of the statement by Judge Gary in the late report of the Steel Corporation to the effect that conferences have been held with competitors to go over various situations that have lately arisen.

The rail situation is expected to work itself out within the next month and manufacturers anticipate that before the first of the year the railroads will place contracts for their 1908 requirements. A new schedule of prices based upon the percentage of crop from the blooms will be announced within a few weeks.

The Bessemer pig iron situation has weakened considerably since the last report. The October monthly average price was $21.88½ valley furnace as against $22 for September. The average was taken from total sales of 21,500 tons. The leading independent producer of Bessemer iron is now quoting $21 valley for delivery over the remainder of the year. While no selling price has been fixed for the opening of next year, it is estimated that independent producers figure upon $20 at the furnace.

Pig Iron.—There is no life or interest evident in the pig iron market. No sales of any note have been consummated, there has been no firm inquiry and consumers are evidently looking around only enough to keep in touch with the situation without exciting suspicion as to their purpose. Prices are purely nominal at best, and while furnaces all have their asking price for iron to be delivered over the remainder of the year, the range is $1 to $3 per ton. The Carnegie Steel Co. has 17 furnaces out of blast, the Republic Iron & Steel Co. one, with another under consideration; the Shenango Furnace Co. has one stack out and is not pushing construction work on new No. 2; it is reported the Lackawanna Steel Co. has two stacks out at Buffalo and four small ones in the Lebanon district.

The asking price for Bessemer iron has fallen off $1 per ton since last week and the leading independent producer is now quoting $21 valley furnace for delivery before Jan. 1. The average monthly price during October was $21.88 1-2 valley furnace, as compared with $22 in September. As far as can be learned there are no stocks at valley furnaces on Bessemer iron. The nominal asking price on basic iron is $19 valley and on northern No. 2 foundry grade $19.50 to $20 at the furnace, although on a firm offer this could probably be shaded. There is no inquiry for gray forge or mill iron. For deliveries over the remainder of the year, we make the following nominal quotations:

Bessemer, Valley	$21.00 to 21.50
Bessemer, Pittsburg	21.90 to 22.40
No. 1 Foundry, Pittsburg	21.65 to 22.15
No. 2 Foundry Pittsburg	20.40 to 20.90
Gray Forge, Pittsburg	19.90 to 20.40
Basic, Valley	19.00
Basic, Pittsburg	19.90

Ferro-Manganese.—In the face of no inquiry and little effort on the part of importers and brokers to sell, we quote $55 to $56 delivered Pittsburg on ferro-manganese, foreign 80 per cent.

Imported 50 per cent ferro-silicon is quoted $100 to $102 Pittsburg, for prompt at $97 to $98 on forward deliveries, domestic, 12 per cent, $36; 11 per cent, $35; 10 per cent, $34. The lower grades of imported ferro-silicon are quoted 50 cents lower. These quotations are applicable to Pittsburg territory.

Plates.—Old contracts are being taken out very freely by specifications, and the steel car companies, which are the largest consumers, report that they have received no cancellations from the railroads. They are, however, receiving but very few inquiries on new work. Prices are firm and we continue to quote:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.70c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all

sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—There are fewer reports of price cutting this week than for the past two or three weeks, and what is done is mostly in the way of giving away freight advantages. There is a little new business, orders for moderate lots coming into the mills from widely distributed points. We continue to quote as follows:

Black steel sheets, one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c; blue annealed, No. 10 and heavier, 1.85c; Nos. 11-12, 1.90c; Nos. 13-14, 1.95c; Nos. 15-16, 2.05c. Corrugated roofing, $1.90 per square for No. 28 painted, 2½-inch corrugation, and galvanized, $3.25 per square for No. 28.

Tin Plate.—The dull business as far as tin plate is concerned has been responsible during the week for shutting down the Columbus, O., and Bellaire, O., mills of the Carnegie Steel Co. where sheet bars have been rolled. Independent mills are running fuller than the leading interest, which has decided not to accumulate any large stocks. Prices remain firm as follows:

Coke tin plate 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less 2 per cent for cash in 10 days.

Rails and Track Material.—The Carnegie Steel Co. last week did not take on any additional standard rail business, but during the first two days of the present week closed for 3,000 tons of standard sections for a railroad operating east of Pittsburg, this contract calling for prompt delivery. The purchase of control of the Tennessee Coal, Iron & Railroad Co. by the Steel Corporation is the biggest piece of information received in Pittsburg for many months, and will place the Corporation in control of the rail situation aside from the output of the Bethlehem Steel Co., Pennsylvania Steel Co. and Cambria Steel Co. The leading interest during the week closed with the Bessemer & Lake Erie railroad, a constituent company, for 136,000 steel cross ties for new construction work on its road between Pittsburg and Conneaut, and 70,000 ties for repair work. These will weigh 180 pounds to the tie. By the end of the present year, the Bessemer & Lake Erie will have 90 miles of its roadway laid with steel cross ties. The demand for spikes is very light, and a part of the spike making equipment of the Brown-Bonnell plant of the Republic Iron & Steel Co. at Youngstown has been closed. With the expected relief in financial circles, a buying movement in rails is expected before the end of the year. Rail manufacturers anticipate that railroads will cover for their 1908 requirements. On the standard of 1907 specification, we quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; 8-pound, $38; 12-pound, $34 to $37; 16-pound, $32; 20-pound, $31; 25 to 45-pound, $30; angle splice bars for standard sections, $1.65; standard spikes, $2 Pittsburg; hand spikes, $2.20 to $2.25 Pittsburg.

Steel.—Conditions surrounding semi-finished steel represent a waiting market, and a careful investigation of the situation develops that nearly all users of billets and sheet bars have covered for their requirements until Jan. 1 and no disposition is being shown on the part of buyers to contract beyond that period. The Bellaire and Columbus plants of the Carnegie Steel Co. have been shut down. Each of these plants represents two blast furnaces and a sheet bar mill. The capacity of Bellaire is 1,000 tons per day. The closing down of the large majority of tin plate mills and the subsequent decrease in demand for material by them but not by the general trade, is given as the cause of shutting down these two plants. Bessemer billets are quoted nominally at $28, Pittsburg, and open-hearth billets at $29. There is no new inquiry in the market and producers are not urging prospective buyers to close for the material. The official price on sheet bars is still $31 Pittsburg, and reports to the effect that this price has been shaded have not been confirmed.

Hoops and Bands.—This market is extremely quiet and while some interest has been shown in next year's requirements, no buying has as yet been done. Prices are firm at the 2c base, Pittsburg price. Some slight cutting in cotton ties from southern warehouses has been reported, but this shading has not been general. We continue to quote:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel; cotton ties, 97½c per bundle.

Merchant Bars.—Current new business on both iron and steel bars is very light, and is about on a par with that of the past three weeks. Specifications are being taken out in fairly good shape, and as far as steel bars are concerned there has been no shading in prices, although this cannot be said of iron bars. There has been some bar suspensions, but they have been light in tonnages. We quote as follows:

Common iron bars, 1.65c to 1.70c Pittsburg in carload lots and over, 1.70c to 1.75c in less than carloads; 1.60c base Pittsburg, plus freight to point of shipment on western deliveries; Bessemer steel bars, 1.60c net for future deliveries; 1.85c to 1.95c out of stock; plow and cultivator, 1.60c net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carloads, and 45 per cent in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. Planished and machine straightened tire steel is 1.80c base. Iron finished tire under 1½ by ½, 1.75c. Iron finished tire 1½ by ½ and over, 1.60c base. All tire subject to one-half extra on the steel card.

Structural Material.—The number of new inquiries received by fabricating companies are very small, and the tonnage is not heavy. Practically all building operations are being held in abeyance on account of money conditions and not much improvement is expected before the turn of the year. Business is so light in some quarters that entire drafting forces are being laid off and operations suspended on field work already started. Mills report material being taken out in fairly good shape, but very little new business being received. Prices are firm, however, and we continue to quote:

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.90c; zees, 1.70c; tees, 1.75c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.80c base.

Merchant Pipe.—There has been no

change in the pipe market, which is very firm at quoted prices. Some new business is being received right along, although not involving any large tonnages. Shipments are heavy and mills still have several months' work ahead of them. Inquiries for line pipe ranging from one to five miles are numerous for extension and improvement work, and there is a good demand for all kinds of small pipe. We quote the following official discounts of the leading interest to consumers in large lots.

	—Steel— Black.	Galv.
⅛ and ¼ inch	65	49
⅜ inch	67	53
½ inch	69	57
¾ to 6 inches	73	63
7 to 12 inches	70	55
EXTRA STRONG PLAIN ENDS.		
⅛ to ⅜ inch	58	46
½ to 4 inches	65	53
4½ to 8 inches	61	49
DOUBLE EXTRA STRONG PLAIN ENDS.		
½ to 8 inches	54	43

Boiler Tubes.—This market has been running along steadily without change, and, while the volume of new business is light, consumers are taking out their full contract obligations. Prices are well maintained and we quote the following discounts:

	Iron.	Steel.
1 to 1½ inch	42	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

2¼ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Wire Products.—The demand for wire products continues heavy both from standpoint of tonnage and the number of new orders being placed. Consumers and jobbers are urging deliveries on their contracts, for nails and smooth and welded fence, although the demand for barbed wire is not so heavy. Prices are firm and we quote:

Wire nails, jobbers' carload lots, $2.05, retailers' carload lots, $2.10; less than carloads, $2.15; painted barb wire, $2.20 for jobbers in carloads; retailers in carloads, $2.25c; and less than carload, $2.35; with 30c for galvanizing; plain wire, 1.90c for jobbers, and 1.95c by carload.

Coke.—The coke market has weakened very materially during the past week, and standard Connellsville furnace coke is now quoted $2.45 to $2.50 at the ovens, a decrease of 25 to 30 cents per ton since our last report. There is no inquiry for furnace coke and some furnaces have suspended shipments, some indefinitely and some but temporarily. Considerable coke is being stocked at the ovens and many of the operations in the region are either putting out a part of their ovens or only running five days a week. The steel corporation has 17 blast furnaces out. Republic Iron & Steel Co. has one furnace banked and another upon which further curtailment is being considered. It is reported that the Lackawanna Steel Co. has two of its Buffalo furnaces out, and four small furnaces in the Lebanon district shut down. There is some little inquiry for foundry coke, but prices have been cut and we now quote $3 to $3.15 at the ovens.

Old Material.—The scrap market at best is purely nominal, and the only transactions reported have been small exchanges or trades between dealers. The big consumers show absolutely no interest, and will not consider a buying proposition. On the other hand stocks are low and not much scrap is being offered. We quote the following nominal prices, gross tons, delivered in the Pittsburg district:

Heavy melting scrap, $16 to $16.50; rerolling rails $17.50 to $18; bundled sheet scrap, $13 to $13.50; iron axles, $24.50 to $25; old iron rails, $20 to $21; No. 1 wrought scrap, $16 to $16.50; old car wheels, $23 to $23.50; low phosphorus scrap, $20 to $21; machine shop turnings, $12.50 to $13; cast borings, $11.50 to $12; No. 1 cast scrap, $18 to $18.50.

CHICAGO.

Financial Considerations Paramount—Steel Bars Will Not Be Lower.

Office of THE IRON TRADE REVIEW,
1362 Monadnock Block, Nov. 5.

Overshadowing all other considerations, the financial situation has absorbed the attention of men in every line of trade. More important, in the face of existing conditions of credit liquidations and retrenchment, are ways and means for securing present stability than any plans for future extensions of business. The money situation, while stringent to the point of discomfort, is recognizedly sound and a spirit of co-operation and commendation meets the measures that have been taken to insure the preservation of sane conditions.

Some evidences continue to come to light of further curtailments and we note that both the 8-inch and 12-inch mills of the Republic Iron & Steel Co. at Moline, shut down on the occasion of the death of Chas. H. Deere, have not resumed. It is worthy of special emphasis, however, in view of contrary reports, that there will be absolutely no reduction in the price of steel bars, which applies as well to plates and structural material. Prices on these products were maintained at a constant level during periods of great demand and the same policy will be pursued under any other circumstances.

We are quoting this week a reduction of $1 a ton on all sizes of cast iron pipe, but cannot find that sufficient business has been done of such nature as would establish a market price to justify weakened quotations in pig iron or the various forms of steel. Billets and sheets, however, give evidence of possible weakening from present quotations. Wire products are somewhat less active and in general a larger number of requests for delayed deliveries are being received. Scrap seems not to have reached bottom figures and further reductions are noted, but the weak prices are not significant of any increase in sales.

Pig Iron.—Attention has been given to the financial situation to such an extent not only as a general proposition but as it has affected pig iron interests individually that apparently little time or inclination has been left for the transaction of business. The paucity of inquiries approached in degree the acknowledged scarcity of sales. Southern iron is quoted from $17 to $18 for No. 2 at Birmingham, but there has not been enough business transacted to establish the market at either figure. While it is not denied that iron has been sold below $17, it is also generaly accepted that this is largely resale iron and that iron from the furnace commands $17 as a low price. Northern iron is not being quoted at lower prices this week, but the volume of business is very light. Sales of carload lots are made and nearly all of the inquiries received are for such amounts or up to a few hundred tons. No contracts have been made for next year's delivery not already reported, while further reductions in price are freely predicted in buying quarters, but furnace men are frankly announcing their intention to bank their furnaces in preference. We continue to qoute Chicago delivery for the remainder of the year as follows:

Lake Superior Charcoal	$26.00 to 26.50
Northern Foundry No. 1	22.00 to 23.00
Northern Foundry No. 2	21.50 to 22.50
Northern Foundry No. 3	21.50 to 22.00
Southern Foundry No. 1	21.85 to 22.35
Southern Foundry No. 2	21.35 to 22.35
Southern Foundry No. 3	20.85 to 21.85
Southern Foundry No. 4	20.35 to 20.85
Southern No. 1 Soft	22.85 to 23.35
Southern No. 2 Soft	22.35 to 22.85
Southern Gray Forge	20.85 to 21.35
Southern Mottled	20.35 to 20.85
Southern Silveries, 4 per cent Silicon	24.35 to 24.85
Southern Silveries, 5 per cent Silicon	25.35 to 25.85
Southern Silveries, 6 per cent Silicon	26.35 to 26.85
Jackson Co. Silveries, 6 per cent	30.40
Jackson Co. Silveries, 8 per cent	32.40
Jackson Co. Silveries, 10 per cent	34.40
Malleable Bessemer	22.50 to 23.00
Standard Bessemer	22.15 to 22.65
Valley Basic	22.85 to 23.35
Alabama Basic	23.35 to 23.85

Billets and Rods.—No transactions larger than car lead lots have been recorded during the past week. The three largest producers are pretty well sold up and the available supply from other sources has not been made very definitely known through lack of any movement. The local mills are maintaining quotations without change. We quote forging billets, Chicago delivery, from $34 to $36 and f. o. b. Pittsburg we quote: Rolling billets, $28; Bessemer wire rods, $37; open-hearth rods, $38 and sheet bars, $31 to $31.50.

Merchant Bars.—There will be absolutely no concessions from the price of steel bars at the level maintained when other commodities were commanding boom prices, and we quote 1.78c Chicago without possibility of change. Demand, however, is light. Iron bars are not so firmly established, but there has been no reduction in the asked price. Trading in machinery steel has been quiet, but weakening in prices is noted. The volume of business is light, but consumers' stocks are small and there will be no large supplies on hand, when the present inactivity passes, to be used up before buying begins. Our prices are quoted without change for carload lots, Chicago delivery as follows:

Bar iron, 1.78c; soft steel bars and bands, 1.78c, half extras; soft steel angles, less than 3 x 3, 1.88c; hoops, 2.18c base, full extras; planished or smooth finished tire steel, 1.98c; iron finish, up to 1½ x ½ inch, 1.93c base; iron finish, 1½ x 1½ inch and larger, 1.78c base; channel for solid rubber tire, ¾ to 1 inch, 2.28c, and 1⅛ inch and larger, 2.18c; smooth finished machinery steel, 2.18c; flat sleigh shoe, 1.83c; concave and convex sleigh shoe, 1.93c; cutter shoe, 2.36⅛c; toe calk steel, 2.33c; railway spring, 1.98c; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 54 per cent off the list f. o. b. Pittsburg for carload lots, and 48 per cent off for less than carload lots. On iron and steel bars from local stocks, we quote as follows: Bar iron, 2.25c, full extras; soft steel rounds, and square, 3-inch and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by ⅛ inch and larger, $2 per 100 pounds base; 4½ inches by 5 inches and 6 inches by 5/16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $2 half extras; soft steel hoops, $2.50 full extras. Other sizes not mentioned above, $2 per 100 pounds base, plus half extras.

Plates.—While the only activity in plates in this market is in meeting specifications on contracts, new business being in almost negligible quantity, there is no chance of lower prices than have prevailed, being offered. Material that has been ordered is asked for promptly and orders on the books will undoubtedly be filled with but very little retrenchment. We quote as follows:

Plates, ¼ inch and heavier, 6¼ to 100 inches wide, either universal or sheared, 1.70c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 18c per 100 pounds for carload lots, and 21c for less than carload lots. Jobbers' prices for shipment from local stocks are as follows: Tank steel, ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch, 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.40c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—There has been nothing to add strength to the situation in sheets and practically all transactions were at the bottom prices quoted. Further reductions in prices may possibly be made, but, as in other lines, buying is not being held back because prices are not right and it seems unlikely that, with conditions remaining as they are at present, buying will be started simply by price concessions. We quote:

Black sheets, Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets, No. 28, 3.75c Pittsburg. Freight to Chicago, 18c per 100 pounds for carload lots, and 21c for less than carload lots. Jobbers' prices on carload lots and less from store are as follows:

No. 10, 2.40c to 2.45c; No. 12, 2.45c to 2.50c; No. 14, 2.50c to 2.55; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.70c to 2.80c; Nos. 22-24, 2.75c to 2.85c; No. 26, 2.80c to 2.90c; No. 27, 2.85c to 2.95c; No. 28, 2.95c to 3.05c; No. 30, 3.25c to 3.35c. Galvanized sheets, Nos. 10 to 20, 3.30c to 3.35c; Nos. 22 and 24, 3.60c to 3.70c; No. 26, 3.80c to 3.85c; No. 27, 4c to 4.10c; No. 28, 4.20c to 4.30c; No. 30, 5.35c to 5.40c.

Structural Steel.—None of the undertakings at Milwaukee, San Francisco, New Orleans, Kendall, Washington or Chicago which last week were held over, have changed in status. The small lots which during the past week made up the total structural business as well were in less volume than usual and structural steel experienced one of the quietest weeks it has had. Specifications on contracts and insistent demands for deliveries are not falling off at all in the face of the dullness, particularly where material ordered is associated with agricultural consumption. The attitude of implement makers indicates a confidence that there will be a normal buying movement in their products during next year. As in plates and steel bars, a firm determination exists among fabricators to maintain present prices on all structural material. We quote as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from Pittsburg to Chicago, 18c per 100 pounds for carload lots, and 21c per 100 pounds for less than carload lots. Quotations from store are as follows:

All angles, 3 inches and larger, including six inches, $2.05 per 100 pounds; angles, over six inches, $2.15 per 100 pounds base; beams, 3 to 15 inches inclusive, $2.05 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—There has been no purchasing of rails during the week. Transactions of any size require for their financing the assistance of the banks and sales of noteworthy size will of necessity be infrequent until a less stringent condition again prevails. There have been no further changes in price and we quote:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 25 to 45-pound sections, $32; 20-pound, $33; 16-pound, $34; 12-pound, $35; and lighter sections down to 8-pound, $42, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote, f. o. b. Joliet; Angle bars, 1.65c; spikes, 2.00 to 2.10c; bolts with square nuts, 2.50c to 2.60; with hexagon nuts, 2.75c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.40c to 2.50c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Cast Iron Pipe.—As anticipated last week, the price of cast iron pipe is now quoted $1 lower on all sizes. No lettings of ordinarily desirable tonnages are in prospect and the week has been without any sales of like character. A very quiet condition obtains and probably will through the rest of the month, but in December there may naturally be expected some, but doubtless very limited contracting for spring municipal work. We have changed our prices and quote 4-inch water pipe $36; 6 and 8 to 12-

inch $35; larger sizes $34; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—Changes in the quantity of new business contracted for are few. Orders on the books at the mills are being filled with dispatch and more rapidly than new business is being placed. A condition much more nearly normal exists in tabular goods, however, than in many other lines and the growing dullness is not yet reflected in the current status of this trade. No changes in price are contemplated.

We quote mill discounts, Chicago delivery, carload lots, as follows: On steel pipe, jobbers are allowed a concession of one point and five per cent additional from the schedule in force:

MERCHANT PIPE.

	—Steel— Black.	Galv.
¼ to 6 inches, inclusive	71.2	61.2

BOILER TUBES.

	Steel.	Iron.
2¼ to 5 inches, inclusive	62.2	49.2

Mill quotations on iron pipe are from four to five points higher than above. A concession of one point from the following quotations is allowed by Chicago jobbers on carload orders for shipment from local warehouse stocks. We quote for less than carload lots as follows:

MERCHANT PIPE.

	Black.	Galv.
⅛ to ¼ inch	61	45
⅜ inch	63	49
½ inch	65	53
¾ to 6 inches	69	59
7 to 12 inches	65	50

Minimum prices for wrought iron pipe, carload lots or greater, from Chicago stocks, are as follows. ⅛ inch to ¼ inch, 55; ⅜ inch, 57; ½ inch, 59; ¾ inch to 6 inches, 64; 7 inches to 12 inches, 59. Boiler tubes from store are unchanged at 60 off for steel, 47½ for iron, and 42½ for seamless, base sizes, 2⅛ inches to 5 inches.

Wire Products.—Some few buyers are asking for slight delays in the delivery of wire goods contracted for and some cancelling is occurring, but as yet such instances are exceptional and indicate simply a possible and not unnatural slackening from the good volume of trading uniformly maintained in these products up to the present time. The support of the farming trade is relied on to prevent any severe or prolonged weakness and as yet no actual weakening has come to light. Jobbers' stores are considerably depleted and no purchases to replenish them have been made of late, all buying being for immediate consumption. This is a strengthening feature. We quote to jobbers, Chicago delivery, as follows:

Wire nails, $2.23; painted barb wire, $2.38; galvanized barb wire, $2.68; smooth annealed wire, $2.08; smooth galvanized wire, $2.38; polished staples, $2.23; galvanized staples, $2.63. Carload lots to retailers, 5 cents higher; less than carload lots, 15 cents higher.

Coke.—The past week has witnessed a very good movement of coke in this district and the strength which has characterized the trade in this fuel without interruption continues unabated. Some small lots of good furnace coke can be obtained at attractive prices from furnaces which are beginning to reduce output, but the total quantity available is not large. We quote our prices unchanged as follows: Connellsville 72-hour foundry coke, $3.25 to $3.40 and high grade standard Connellsville furnace coke, $2.85 to $3 at the ovens.

Old Material.—In the words of one dealer, "There was no scrap market this week." Dealers have gotten to the point where they are telling each other what they are doing, which is good evidence that they are doing very little. There is practically no consumptive buying and prices continue to sag. We note among other reductions a weakening of 50 cents in car axles. Some of the railroads are piling their old material and show no inclination to sell at present prices.

Old Car Wheels	$24.50 to 25.00
Old Iron Rails	19.75 to 20.25
Rerolling rails (3. ft. and over)	17.00 to 17.50
Old steel rails (3 ft. and under)	$16.50 to 16.75
Light Section Relayers, 45 lbs. and under, subject to inspection	30.00 to 32.00
Relaying Rails, subject to inspection	28.00 to 30.00
Frogs, Switches and Guards	14.00 to 14.50
Heavy Melting Steel	14.00 to 14.50

We quote net tons as follows:

No. 1 R. R. Wrought	$14.00 to 14.50
No. 2 R. R. Wrought	13.00 to 13.50
Knuckles, Couplers and Springs	14.00 to 14.50
Shafting	17.50 to 18.00
Iron Car Axles	22.50 to 23.00
Steel Car Axles	19.50 to 20.00
Dealers' Forge No. 1	11.50 to 12.00
Pipes and Flues	10.75 to 11.25
No. 1 Cast. 150 lbs. and less	15.50 to 16.00
No. 1 Mill	9.00 to 9.50
Mixed Busheling (Nos. 1 and 2)	9.75 to 10.25
Country sheet	8.00 to 8.50
No. 1 Boiler Cut	9.75 to 10.25
Boiler Punchings	14.00 to 14.50
Cast Borings	8.25 to 8.75
Mixed Borings, etc	8.25 to 8.75
Machine Shop Turnings	9.50 to 10.00
Railroad Malleable	14.00 to 14.50
Agricultural Malleable	13.25 to 14.00
Stove Plate and Light Cast Scrap	13.50 to 14.00
Old Iron Splice Bars	16.50 to 17.00

CLEVELAND.

October Ore Shipments Large—Reported Cutting in Plates.

Office of THE IRON TRADE REVIEW, Browning Bldg., Nov. 5.

Iron Ore.—A remarkably good showing of ore shipments from the Superior ranges was made during the month of October, when a total of 6,482,654 tons was brought down, compared with 5,062,794 tons in October, 1906, a gain of 1,419,860 tons. The October shipments bring the grand total of the season of 1907 up to 37,041,861 tons, against 33,238,835 tons the corresponding date of 1906, an increase of 3,803,026 tons. This leaves but practically 500,000 tons to be brought down the remainder of the shipping season to equal the entire shipment of 1906, and it indicates a total movement during the present year in excess of 41,000,000 tons. The November shipments have started off well, and with good weather will hold their own in the record-breaking movement. No sales of ore are reported. The month's shipments and the season to date, compared with corresponding periods in 1906, are shown in the above table.

Port—	Oct. 1906.	Per cent of total.	Oct. 1907.	Per cent of total.
Escanaba	697,068	12.77	779,626	12.03
Marquette	363,481	7.18	359,662	5.55
Ashland	413,029	7.66	381,507	5.88
Superior	904,571	17.87	1,176,027	18.14
Duluth	1,620,828	32.01	2,502,256	38.60
Two Harbors	1,063,817	21.01	1,283,576	19.80
	5,062,794	100.00	6,482,654	100.00

Port—	To Nov. 1, 1906.	Per cent of total.	To Nov. 1, 1907.	Per cent of total.
Escanaba	4,976,360	14.94	5,253,043	14.19
Marquette	2,509,286	7.55	2,701,812	7.30
Ashland	3,049,054	9.17	3,103,838	8.38
Superior	5,352,745	16.11	6,747,945	18.20
Duluth	9,955,216	29.96	11,908,539	32.12
Two Harbors	7,405,174	22.27	7,326,684	19.79
	33,238,835	100.00	37,041,861	100.00

Pig Iron.—An unsettled condition is prevailing in the pig iron market due to the general financial situation. Buyers appear to be unwilling at present to take on tonnage at any price and are confining their orders to immediate needs. Heavy stocks are being carried by neither melters nor furnace men, and the former are apparently encountering little difficulty in obtaining good shipments of their requirements. Requests to withhold shipments are more frequent, and it is believed that the melt in this territory has decreased somewhat lately. There have been some cancellations of contracts. Sales are so few that prices are altogether nominal. We note the sale of a small tonnage of spot No. 2 foundry to an outside interest at $20, Cleveland, and in a special instance $19.50 was quoted. A recent sale of spot malleable brought about $20 furnace. Barring a few half-hearted inquiries, iron for

first half continues to attract no attention. We quote, f. o. b. Cleveland, for the remainder of the year, as follows:

Bessemer	$21.90
No. 1 Foundry	21.00 to 21.50
No. 2 Foundry	20.50 to 21.00
No. 3 Foundry	20.00 to 21.50
No. 2 Southern	21.35 to 21.85
Gray Forge	20.00 to 20.50

Coke.—The coke market continues firm, with some buying for delivery over the first half of next year. Few transactions are reported in this district. We quote high grade furnace coke at from $3 to $3.15 ovens for the remainder of the year, and from $2.90 to $3 ovens for the first half, and foundry coke at from $3.25 to $3.50 ovens for last quarter and first half.

Finished Material.—A hesitancy to purchase beyond the requirements of work under contract is being displayed by buyers in finished material, and new orders are light as well as specifications against existing contracts. Inability at this time to finance undertakings is holding up a number of projects in this district, and in one building improvement, a postponement for a year has been necessitated. Cutting in light plates in addition to sheets by independent interests is currently reported, but the larger interests are holding their prices firm. In sheets the principal interest is promising galvanized in wide widths in six weeks and blue annealed in from eight to ten weeks, while the independents are able to make very prompt deliveries on galvanized and American Bessemer. Bar iron has gained no strength, but local mills have taken several fair sized railroad contracts lately and are all operating. There is considerable activity in billets. Mill business to jobbers is not so active. Stock trade is holding up well.

The Cleveland office of a large steel company recently sent out 100 letters to patrons in its district, soliciting their expression of business conditions, as reflected by their individual cases. The replies received were quite general and with but a single exception, the companies reported their trade to be in a good, healthy condition and were optimistic over the future.

Old Material.—With the mills taking old material lightly and practically at their own prices, the market continues to decline. Cancellations of bar iron contracts are not infrequent, and these have resulted in a corresponding refusal of the mills to accept any scrap from the dealer. It is not believed that the bottom has yet been reached by the market. The Erie railroad has closed on a list at the prevailing prices, while the Pennsylvania lines west with 5,000 tons and the Wheeling & Lake Erie with 1,000 tons are asking for bids. We have revised our prices, and quote, f. o. b. Cleveland, gross tons, as follows:

Old iron rails	20.00 to 21.00
Old steel rails (re-rolling)	16.00 to 17.00
Old steel rails (under 6 feet)	16.00 to 17.00
Old car wheels	21.00 to 22.00
Steel boiler plate	13.00 to 13.50
Steel axles	19.00 to 20.00
Malleable iron (railroad)	14.50 to 15.50
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	14.00 to 14.50
Country mixed steel	12.00 to 12.50
Low phosphorus	18.50 to 19.50
We quote net tons as follows:	
No. 1 R. R. Wrought	13.50 to 14.00
No. 1 busheling	12.00 to 12.50
No. 1 machine cast	15.50 to 16.00
Iron axles	20.50 to 21.50
Axle turnings	10.50 to 11.00
Machine shop turnings	9.00 to 10.00
Grate bars	12.50 to 13.00
Pipes and flues	11.50 to 12.00
Tank iron	11.00 to 11.50
Hoop and band iron	7.00 to 7.50
Sheet iron	5.50 to 6.60
Wrought drillings	9.00 to 9.50
Stove plate	13.00 to 13.50
Cast borings	7.50 to 8.50

CINCINNATI.

Not Enough Business to Test the Market—Hand to Mouth Policy.

Office of THE IRON TRADE REVIEW,
First National Bank Bldg., Nov. 5.

Pig Iron.—The market is under the influence of the general condition of business and financial affairs. The limited demand is confined to car loads and upward to 100 tons for immediate needs. One inquiry from a melter in central Ohio calling for 800 tons of foundry iron with analysis specifications which call for Virginia or northern iron to comply with the requirements, is attracting attention, as the price at which this order is taken is expected to indicate the minimum quotation obtainable. It is said that something under $19 at Ironton furnace for No. 2 foundry has already been named.

Southern iron is considered quotable at $17 Birmingham for No. 2 foundry, but under competition for any fair tonnage there are strong indications that this price can be shaded. There has not been enough business going to fully test the market for minimum prices this week. The trade is accepting the situation with a spirit of resignation and waiting for developments to bring the conditions to a more satisfactory or at least a more settled position.

Buyers are not inclined to buy beyond their immediate needs. Resale iron is coming to light somewhat more plentifully. Sellers are cautious as to whom they sell and are watching credits closely.

Under the dullness of the past few months, some southern furnaces have gained a little in stocks, but it is said to be mostly made up of the low grades. We quote for prompt delivery and for the remainder of the year delivered Cincinnati as follows:

Southern Foundry No. 1	$20.75 to 21.25
Southern Foundry No. 2	20.25 to 20.75
Southern Foundry No. 3	19.25 to 19.75
Southern Foundry No. 4	18.75 to 19.25
Southern No. 1 Soft	20.75 to 21.25
Southern No. 2 Soft	20.25 to 20.75
Southern Gray Forge	18.25 to 18.75
Northern No. 1 Foundry	20.70 to 21.70
Northern No. 2 Foundry	20.20 to 21.20
Northern No. 3 Foundry	19.70 to 20.20

Finished Material.—The market is quiet and unchanged. Small orders from stock are filled here at the following prices:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch, 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, $2 base; boiler tubes, 62 per cent off base; turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—There is little life to the market. Prices show no quotable change. The movement off the N. & W. is reported good while ovens on the C. & O. are short of equipment and are not shipping up to the normal. Contracts for next year's wants are not under consideration as yet. Quotations in the leading coke producing districts are as follows:

Wise County furnace coke	$2.85 to 3.00 per ton
Wise County, Va., Foundry Coke	3.00 to 3.25 per ton
Pocahontas Furnace Coke, prompt shipment	2.60 to 2.75 per ton
Pocahontas Foundry Coke	3.00 to 3.25 per ton
Connellsville Furnace Coke, prompt shipment	2.85 to 3.00 per ton
Connellsville Foundry Coke	3.25 to 3.50 per ton
New River Foundry Coke, prompt shipment	3.35 to 3.50 per ton
New River Furnace Coke, contract	2.85 to 3.00 per ton

Old Material.—The market is dull and easy. Some quotations are slightly lower. We quote dealers' prices as follows:

Old No. 1 R. R. wrought, net tons	$15.00 to 15.50
Cast machine and fdy., net tons	16.50 to 17.00
Old iron rails, gross tons	21.50 to 22.00
Old steel rails (re-rolling) gross tons	17.00 to 18.00
Old short lengths, gross tons	17.00 to 18.00
Old iron axles, net tons	21.50 to 22.50
Heavy melting scrap, gross tons	16.50 to 17.00
Stove plate, net tons	13.50 to 14.50
Wrought turnings, net tons	10.00 to 10.50
Cast borings, net tons	8.50 to 9.00
Car wheels, gross tons	22.00 to 23.00

Attorney Walter F. Jenkins of Buffalo has been appointed receiver of the Gillies Engine & Machine Co., Tonawanda, N. Y. An involuntary petition in bankruptcy was filed recently by the Tonawanda firm.

PHILADELPHIA.

Pig Iron Buying Very Limited—Scrap Is Weaker.

Nov. 5.

Pig Iron.—Buying has fallen to very small figures, and is almost entirely confined to carload lots. An exception may perhaps be made of basic, several thousand tons of which have recently been sold to eastern mills at the lowest figures yet touched. According to current rumor, these went as low as $17.75 and are indicative of the needs of an important furnace man. As most eastern furnaces are pretty well sold up for the remainder of the year, there is no pressure to sell at present figures, but much concern is felt about the new year, which promises to start with order books in very poor shape. Inquiries among both pig iron and finished material men reveal a very general belief that the first few months of 1908 are going to be exceptionally quiet and that production will have to be cut down very considerably if any semblance of decent prices is to be maintained. If this is done and labor and other conditions, such as ore and fuel prices, are brought into line with the new order of things, an improvement is not unlikely in the last half of the year. Reports from industrial establishments show that there is very little new business in sight beyond January, and that the present activity, such as it is, is almost entirely on orders placed some time ago. With such a poor outlook for buyers, it is not surprising that prices have sagged a little, though in most grades there is hardly enough doing to give a basis for anything like exact quotations. They may be quoted as follows:

No. 1X Foundry	$20.25 to 21.00
No. 2X Foundry	19.00 to 19.75
No. 2 Plain	18.75 to 19.25
Basic	17.75 to 18.25
Low Phosphorus	27.00 to 27.50

New Material.—Some cutting in the price of refined iron bars is reported, but it is mostly for inferior material, and prices as a rule are well maintained. There is a general disposition among buyers to refrain from purchases until the financial situation has cleared, and no new activity is expected before 1908 comes in. Some prominence has been given to the fact that the Alan Wood Iron & Steel Co., which has temporarily closed its new rolling mill near Conshohocken for repairs, has led in the movement for wage reduction by reducing the pay of its men about 10 per cent. In explanation it should be said that the new mill is in rather an isolated location, and that because of the expense incurred in reaching it from neighboring towns the men were given extra compensation. This has been lopped off and their wages brought down to the standard rule. Beams, channels and angles, according to specifications, 1.85c to 1.90c; refined iron bars, 1.75c to 1.80c; steel bars, 1.75c to 1.85c; plates, 1.85c to 1.90c.

Old Material.—The bottom seems to have literally dropped out of the scrap market, and reductions in price ranging from 25 cents to $1.50 have been common during the past week. Especially weak was No. 1 steel scrap, whose bid price fell from $14.75 to $13.50. The market broke on comparatively small offerings by railroads and industrial plants, for which there was no demand, and the asking prices were dropped until they became speculatively attractive. For the first time in many months, the cheapest grades of scrap are now under $10 a ton, with no immediate prospect of improvement. Prices may be quoted as follows:

Old steel rails	$15.50 to 16.00
No. 1 steel scrap	13.50 to 14.00
Old steel axles	20.25 to 20.75
Old iron axles	24.00 to 25.00
Old iron rails	18.25 to 18.75
Old car wheels	22.00 to 23.00
Choice scrap R. R. No. 1 wrought	17.00 to 17.50
No. 1 yard scrap	15.50 to 16.00
Machinery scrap	17.00 to 17.50
Low phosphorus scrap	19.00 to 19.50
Wrought iron pipe	13.00 to 14.00
No. 1 forge fire scrap	13.00 to 13.50
No. 2 forge fire scrap, ordinary	9.50 to 10.00
Wrought turnings	12.00 to 12.50
Axle turnings, heavy	13.00 to 13.50
Cast borings	9.25 to 9.75
Stove plates	14.00 to 14.50

NEW YORK.

Limited Sales and Curtailment of Production—Prices Show Little Change.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Nov. 5.

Pig Iron.—Aside from one considerable sale of pipe-making iron to an eastern pipe interest and one or two sales of basic, aggregating some 6,000 to 8,000 tons, business during the past week has been exceedingly small, as was naturally to be expected with financial conditions in a turmoil. The current week, however, has developed some additional inquiry which gives promise of resulting in business. Several 1,000-ton inquiries are in the market, partly for delivery in 1908, which is a noteworthy feature, inasmuch as the melting industry has had little concern over next year's iron for some time past. The week has brought out several announcements of retrenchments in the manufacturing field, but foundries are seemingly faring better than the average and in most cases are still running full time with full forces; pig iron salesmen report that stove foundries are particularly busy. The tendency of prices, nevertheless, is still downward, and No. 2X Foundry is now on the level of $18.50, eastern furnace, with unverified rumors of even slightly lower figures.

Curtailment of operations continues, with the merchant furnaces apparently doing better than those turning out steel-making irons. The Lackawanna Steel Co. on Oct. 31 blew out its five furnaces and closed down its entire plant at Lebanan, Pa. This includes the coke oven plant. The Steel Corporation has in the neighborhood of a score of furnaces out. The Bellaire works, including two stacks and a mill making some 30,000 tons of sheet bars a month, closed down late last week. The furnaces which have been closed are well sprinkled over all the section covered by the corporation's activities; as a rule they are the smaller, outlying stacks, but in the aggregate probably represent close to 20 per cent of the corporation's total pig iron capacity.

British warrants have broken badly and today are quoted at 49s 9d for No. 3 Middlesbrough. The foreign movement continues, though at a reduced rate.

We quote, tidewater delivery, as follows:

Northern Foundry No. 1	$20.50 to 21.00
No. 2X Foundry	19.25 to 19.75
No. 2 Plain	18.75 to 19.25
Malleable	20.50 to 21.00
No. 2 Southern Foundry	21.50 to 22.00
Basic	18.50 to 19.00

Ferro-Manganese.—There has been a further break in prices, but current transactions are still limited, the lower figures so far having had no stimulating effect. Sales for interior shipment, 1908 delivery, are reported at lower than $50, tidewater, with somewhat higher prices prevailing on early shipments.

Finished Materials.—November with a number of interests was a record-breaking month in more ways than one. The American Bridge Co., for instance, turned out more than 60,000 tons of steel, surpassing the old monthly record of 58,700 tons, but booked only about 20,000 tons, the lightest for the year. Several records were broken by other corporation plants and production generally was at a high rate, but new business taken was limited throughout the industry. Structural bookings of the past week include 1,200 tons for the Brooklyn warehouse of the American Sugar Refining Co., taken by the National Bridge Co.; 1,800 tons for Delaware & Hudson bridges, and 500 tons for three sand barges for the St. Louis district, taken by the American Bridge Co.; 1,200 tons for a building at New Orleans,

taken by the receivers of Milliken Bros.; 500 tons for Pennsylvania railway bridges, and 200 tons for a Milwaukee brewery extension. Tenders are in on 1,500 tons of plates for New York pier shed work and 1,700 tons of structural shapes for a Brooklyn pier shed, but the latter will probably not be placed, owing to the city's retrenchment decision. No requests for cancellations are reported from railroad interests, but there are frequent calls for delayed shipments, which are quite welcome in view of the fall rush for building materials.

Following the closing ten days ago of its Columbus, O., plant, the Steel Corporation has shut down its Bellaire works, operating on sheet bars, the monthly reduction in this line aggregating some 50,000 tons. No further recessions are in immediate prospect. The Lukens Iron & Steel Co. is operating only eight of its fourteen furnaces, but two of those now idle are closed for repairs.

Prices on all lines of finished materials are being well maintained. Plates are selling freely on the 1.60, Pittsburg, base, premium business having disappeared. There is some shading on bar iron, in sympathy with the weak scrap market. Billets are selling locally on the basis of $27, Pittsburg, for 4 x 4. There is an inquiry current for some 1,200 tons from Barcelona. We quote:

Angles, 3 to 6 inches x ¼-inch and heavier, 1.86c; beams, 3 to 15 inches, 1.86c; tees, 3 x ¼-inch and heavier, 1.91c; plates, carloads, tank, 1.86c; marine boiler, 2.26c; bar iron, 1.76c; soft steel bars, 1.76c; sheets, No. 28, black, 2.60c.

Old Material.—Prices are weak, the past few days having witnessed another considerable decline. Mills are buying sparingly, in the hope of still lower prices, and dealers are eager for business, as scrap of all kinds is plentiful. No embargoes are reported, but the Ivy Rock plant of Alan Wood & Co. is closed for repairs, expecting to reopen about the middle of the month. We quote gross tons, New York delivery, as follows:

Old iron rails	$20.00 to 20.50
Old steel rails, rerolling	16.00 to 16.50
Relaying rails	24.00 to 26.00
Old car wheels	22.50 to 23.00
Old iron car axles	23.00 to 23.50
Old steel car axles	18.00 to 18.50
Heavy melting steel	12.50 to 13.00
No. 1 railroad wrought	17.00 to 17.50
Iron track scrap	15.50 to 16.00
Wrought pipe	11.50 to 12.00
Cast borings	7.00 to 7.50
Wrought turnings	10.00 to 10.50
Heavy cast scrap	15.00 to 15.50
Railroad malleable	15.00 to 16.00
Agricultural malleable	15.00 to 15.50
Stove plate	13.00 to 13.50
Grate bars	12.50 to 13.00

ST. LOUIS.

Payment in Checks Not Popular—Market Very Quiet.

Nov. 4.

Pig Iron.—The passing money stringency has had a material effect upon the pig iron market in St. Louis, and the amount of business transacted by local dealers last week is reported as scarcely worth mentioning.

A few melters found it necessary to purchase No. 2 iron for prompt shipment, and orders were accepted by the furnace at prices ranging from $17 to $18, Birmingham basis, the higher price being decidedly rare.

Iron for the first quarter of 1908 is freely quoted at $17, and very little business is being placed at that figure.

The present financial condition is causing many foundrymen to await developments. Collections are not complained of by St. Louis iron men, but actual cash has long since become a rarity. Banks and trust companies are refusing to pay cash on their depositors' checks, having several days ago united upon the method of meeting such demands by the issuance of cashiers' checks payable through the clearing house.

Our quotations, f. o. b. Birmingham, to which $3.75 freight is to be added, follow:

No. 1	Southern	$17.50 to 18.00
No. 2	Southern	17.00 to 17.50
No. 3	Southern	16.50 to 17.00
No. 4	Southern	15.50 to 16.00

Coke.—The coke market is firm, $3.50 to $3.75 being easily obtained for 72-hour Connellsville coke, both for immediate and future shipment. There is very little demand, however, for 48-hour furnace coke, and practically none for smelter.

The car shortage in the Virginia and West Virginia districts has thrown some orders from three to four weeks behind on contracts. A majority of the Connellsville orders are well up, as regards St. Louis contracts, but car equipment is gradually becoming harder to obtain.

Finished Materials.—Standard rails are practically at a standstill so far as buying and prices are concerned. Light rails are in fairly good demand.

Old Material.—No single branch of the iron industry seems to have been hit harder by the stringent money market than the scrap iron business. The necessity for paying workmen with "scrip" has caused a great deal of dissatisfaction. Many mills that contemplated an early resumption of operations have concluded to wait awhile longer, and some of those that have started up have found it difficult to hold their workmen. Our quotations follow:

	GROSS TONS
Second-hand relaying rails, according to time of delivery	$29.00
Steel rails (less than 3 feet)	15.00
Car wheels	24.50
Re-rolling steel rails	17.00
Heavy melting steel	15.00
Country steel mixed	12.00
Iron rails	22.00
	NET TONS
No. 1 R. R. wrought	16.00
No. 2 R. R. wrought	15.00
Iron splice bars and fish plates	17.00
Iron car axles	24.50
Steel car axles	19.00
Iron shaftings (3 to 6 inches)	18.00
Country wrought	12.00
Locomotive tires, smooth inside	15.00
Pipes and flues	12.00
Heavy machinery	15.00
R. R. cast (less than 300 pounds)	14.50
No. 1 Busheling	13.00
No. 2 Busheling	12.00
Boiler sheet and rings	12.00
R. R. cast borings (free of inferior quality)	10.00
R. R. wrought turnings	13.50
Machine shop turnings (free from brass)	11.00
Railroad malleable	14.00
Agricultural malleable	14.00
Cast stove plate	11.00

BUFFALO.

Pig Iron Market Dull—Some Requests to Delay Shipments.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Nov. 4.

Pig Iron.—Prices are well maintained, but the market presents a dull and lifeless appearance. Dealers say that the inquiries now being received are very disappointing. In nearly all cases, consumers are found to be only sounding the market, and even when tempting prices are made, draw back with the statement that they will wait until the market is on a more stable basis.

Several instances are reported this morning where consumers have placed requests to hold their shipments until the latter part of December, and in some cases until the latter part of January. The dealer states that the shipments referred to were due for delivery last month, and it is very evident that consumers are still inclined to move with caution. However, stocks in the foundries are being lowered gradually and it is anticipated that buying must commence soon, even though it is in small quantities.

While some dealers adhere to a scale of prices particularly fitted to their own ideas, it is difficult to quote a scale to cover the general market with much exactness. It is quite probable the following scale of prices for fourth quarter will coincide with the consensus of opinion.

No. 1X Foundry	$21.00 to 21.50
No. 2X Foundry	20.50 to 21.00
No. 2 Plain	20.00 to 20.50
No. 3 Foundry	19.50 to 20.00
Malleable Bessemer	21.00 to 21.50
Gray Forge	19.50 to 20.00
Charcoal	26.00 to 27.00

BIRMINGHAM, ALA.

Production is Being Curtailed and the Market is Very Quiet.

Nov. 4.

The Tennessee Coal, Iron & Railroad Co. has shut down four furnaces and two ore mines. The construction forces at the new steel plant have been laid off and other reductions in forces are being made in the district. But few sales are being made, the furnace companies complaining of the financial stringency and announcing their desire to hold their iron instead of selling it to customers whose credit might not be strong just now. An opportunity was given to sell 5,000 tons of iron the past week to one company, but the customer's credit was not the strongest and the order was not accepted. There has been no general reduction in prices. Apparently, the furnace companies realize that it will not make much difference if prices are reduced.

The plants of the Southern Steel Co. are still in operation. T. G. Bush has been named as a receiver, making four in number for this company.

All corporations in the Birmingham district are using cashier's checks or special exchange in meeting pay rolls on account of shortage of currency in the hands of the bank. Labor has been frightened a little by this move.

METAL MARKET.

NEW YORK.

Nov. 5.

Copper.—Although there is more activity in the market, prices have receded slightly from the high mark set immediately after the turn and are but little above the level reported a week ago. Lake is quoted at 14¼c to 14½c, electrolytic at 14c to 14¼c, and casting at 13¾c to 14c.

Pig Tin.—There has been considerable activity during the week, but declines, both foreign and domestic, occurred on Monday, the metal closing about 31 cents.

Pig Lead.—No change has been made in the quotation of the leading producer, desilverized at New York being held at 4.75c, and at 4.67½c, St. Louis. Other producers, however, continue to sell as low as 4.55c, New York, and 4.45c, St. Louis.

Spelter.—There is no change, either in prices or in the volume of current business, which is still small. We quote 5.45c to 5.50c, New York, and 5.30c to 5.35c, St. Louis.

Antimony.—Cookson's is quotable at 11½c to 12c, Hallett's at 10c to 10½c, and ordinary brands at 9¾c to 10¼c.

ST. LOUIS.

Nov. 4.

Lead and Zinc.—Opposition on the part of miners in the Joplin district to be paid off in checks last week caused so much complaint that mine operators, realizing a necessity for further restricting the ore output, took advantage of the situation and a number of mines were closed down.

This will result in reducing the output in the district about 1,000 tons, and if rumors of more closing of mines materialize, the reduction of output will be doubled before the present week closes.

The top price paid for zinc ore last week was $44 per ton on a base price ranging from $41 to $38 a ton of 60 per cent zinc.

Lead dropped off from $55, a high price of a week ago, to $40 a ton at the close of the week.

CHICAGO.

Nov. 5.

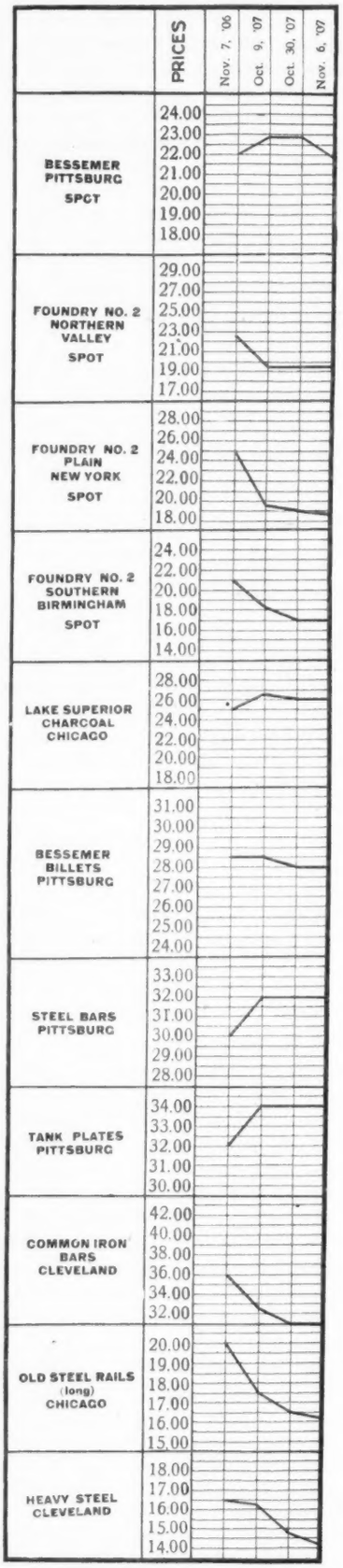
The price of lake copper advanced in this market at the opening of the present week ½ cent above the New York price and sales reported indicate a pretty nearly normal value of business. There is little change in other metals. Cookson's antimony, new, commands a premium of but half a cent over other grades.

We have revised our prices and on carload lots, unless otherwise stated, quote as follows: Lake copper, 16c to 16½c; casting, 15½c to 16c; pig tin, 34½c to 35c; spelter, 5.65c to 5.75c; pig lead, desilverized, 5c to 5.10c in 50-ton lots; corroding, 5.25c to 5.35c in 50-ton lots; car lots, 2¼c per 100 pounds higher; sheet zinc, 7.50c list, f. o. b. LaSalle, in car lots of 600-pound casks; Cookson's antimony, 13c to 13½c; other grades, 12c to 13c.

Old metals have not been at all active and we are not quoting at all on aluminum clipings and cast scrap, no offerings coming into the market. In general prices have recorded a fractional advance. We quote:

Copper wire, 12½c; heavy copper, 12½c; light copper, 11½c; heavy red brass, 12c; heavy yellow brass, 9½; light brass, 6½c; No. 1 red brass borings, 10c; No. 1 yellow brass borings, 7½c; brass clippings, 9½c; tea lead, 3½c; lead scrap, 3¾c; zinc scrap, 3.65c; zinc clippings, 3.90c; tin foil, 24c; tin pipe, 28c; pewter, 18c; electrotype plates, free from wood, 4½c; electrotype dross, 2½c; stereotype plate, 5c; stereotype dross, 3c; prime slab zinc dross, $72 per ton.

PRICE CHART.



SOUTHERN FIELD.

(Continued from page 719.)

strengthening the position of the Trust Co. of America, the president of which, Oakleigh Thorne, has been a member of the Tennessee syndicate. According to these reports, New York banks and trust companies have been carrying about ten millions of loans with the stock of this syndicate as security. The holding pool was made up of extremely wealthy men and it is not intimated that they were unable to carry the big block of stock, but certain members have figured prominently in the recent financial break, and the popular explanation is that the transfer was partly to enable these to realize and partly to place other members in a position to avail themselves of the many stock and bond bargains now offering.

Control of the Tennessee company is desirable to the corporation for two conspicuous reasons. One is the fact that it is already equipped for producing open-hearth steel, now in wide favor with railway interests. A more important consideration is its possession of almost limitless deposits of high grade southern ores and of well developed coal lands. Its rail mill at Ensley is now being rebuilt with doubled capacity, a recent stock issue supplying the necessary funds.

Besides the Ensley steel plant it owns 16 blast furnaces, large blocks of timber and limestone lands and the Birmingham Southern railway. It has been under the same control as the Republic Iron & Steel Co., but merger plans have never been carried out and the Republic company is not involved in the present deal.

The directors of the Tennessee company are: E. J. Berwind, Anthony N. Brady, John W. Gates, George A. Kessler, Grant B. Schley, Oakleigh Thorne, John A. Topping, New York; Leonard C. Hanna, Earl W. Oglebay, Cleveland; Samuel G. Cooper, Pittsburg, and Frank H. Crockard, Birmingham, Ala.

The members of the original pool, which controlled 74 per cent of the outstanding stock were: Grant B. Schley, Col. O. H. Payne, Anthony N. Brady, E. J. Berwind, Harry F. Black, John W. Gates, Oakleigh Thorne, George A. Kessler, Earl W. Oglebay and Leonard C. Hanna. After the stock market panic of March and the retirement of John W. Gates from active trading, four of the persons comprising the pool withdrew. They were Colonel Payne and Messrs. Black, Kessler and Gates.

The Company's Earnings.

The total gross earnings of the Tennessee Co. for the fiscal year ending Dec. 31, 1906, were $13,265,971, an increase of $2,313,992 over the previous year. The operating expenses, however, during the year increased in the sum of $2,044,971, which reduced the net earnings to $2,753,160, an increase of $269,021 over 1905. The fixed charges amounted to $949,973, and dividends to $960,456, leaving the surplus for the year at $126,881. Adding this to the previous surplus, the total surplus of the company Dec. 31, 1906, was $789,397. The physical condition of the mills had been improved by liberal expenditures absorbed in operating expenses. The production of rails, billets, steel bars and plates in 1906 amounted to 401,882 gross tons, as compared with 402,318 in 1905, and 155,266 in 1904. The pig iron production in 1906 was 641,887 gross tons, against 529,036 in 1905, and 475,314 in 1904. Iron ore production last year was 1,483,476 gross tons, against 1,436,282 in 1905 and 1,208,038 in 1904. The production of coal in 1906 was 3,007,657 net tons, against 2,231,659 in 1905.

PITTSBURG FOUNDRYMEN

Discuss the Effect of Rare Metals on Iron and Steel—Titanium and Vanadium Considered.

The November meeting of the Pittsburg Foundrymen's Association, held at the Hotel Henry Monday evening of this week was the most interesting of the present year.

The addresses of the evening were on the effect of rare metals on iron and steel. J. Kent Smith, representing the American Vanadium Co., spoke upon vanadium and C. V. Slocum, of the Titanium Alloys Co., of Niagara Falls, spoke upon titanium. Mr. Slocum's paper will be given in full next week.

After the regular dinner, 18 new members were elected and President H. E. Field complimented the new membership committee upon its progressive work since its appointment a month ago.

In his talk on vanadium, Mr. Smith made the point that the most valuable effect of vanadium upon steel is in eliminating nitrogen and oxygen, and in this way performing great work as a scavenger. While it gives life, compactness and slight increase in tensile strength, its dynamic results are to be most considered, in the form of life giving and of resistance to fatigue and crystalization. Its effects upon cast iron have been greatly beneficial in the way of removing poison in the form of nitrogen, oxygen and sulphur, and in this way, through the removal of these poisons, it has benefited the iron and made it of a higher grade, not only for machine work, but also for general iron castings.

It has been found through the use of vanadium, especially in steel, that the action upon the metal is similar to that of silicon or aluminum, although to a greater extent, in causing a more fluid liquid freer from gases, with a reduction of shrinkage cracks and blow holes, thereby getting a more uniform and compact product. It has been used in chilled rolls to their great benefit, in that it gives a tougher, more ductile product, one that resists the wear of service with fewer re-turnings of the face of the rolls, which is the direct cause of a greater life.

With the use of vanadium in chilled rolls the manganese content can be reduced to a minimum, only an amount necessary to furnish a true chill without any waste of manganese.

The results obtained under cold bends have been such as could only be obtained through the use of mild steel. These results have been attained in forged steel, oil tempered, which have been bent through an arc of 180 degrees without sign of fracture on the outer surface. The results obtained in tensile strength from the same steel, oil tempered, have been 237,000 pounds per square inch, showing a perfect silky cup fracture, with great reduction of area. These results have never been obtained in any carbon steel of an equal carbon content.

Mr. Smith pointed out the necessity of using vanadium after the manganese had been added to the steel or cast iron. If added before the manganese the results obtained would not clarify the steel to the same extent as if added after the manganese, but would simply cause that much more work for the vanadium to do as a scavenger. The greatest results, not only from a scavenging but also from a life giving standpoint, are obtained by the addition of the vanadium from two to three minutes after the manganese had been added, and the two mixed together in the steel.

Mr. Smith stated that with the use of a little good furnace practice and common sense the results obtained from an acid, basic, or air furnace are very much the same, as the vanadium has a great affinity for oxygen and, therefore, should never be added to a furnace if the proper results are to be obtained, except after the clarification of the metal, and even then should never be added except under deoxidizing conditions.

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A STRONG INFLUENCE TOWARDS RENEWED CONFIDENCE.

"If all of us do everything in our power to maintain a high standard for the conduct of affairs in our charge we can be of great benefit in restoring the confidence necessary to success."

These are simple words, but they are pregnant with meaning and suggestion when they are found in an official statement from the management of the greatest manufacturing corporation in the world and when the most critical cannot pretend to think that they do not truly represent the feelings which actuate that management. Throughout the statement which E. H. Gary, chairman of the United States Steel Corporation, made to the directors and the public last week there ring the basic thoughts that the unfortunate conditions which have arisen must be faced by the Steel Corporation, that the gravity of the conditions should be admitted to the public, and that the means invoked to meet them should frankly be disclosed.

It would be absurd to put forth the notion that if the statement of the corporation management is so notably fitted to further public confidence no especial praise is due the management for making it. Too regularly has the public found cause for alarm from a scrutiny of the affairs of semi-public corporations during times of unsettlement, too generally have the managers of large corporations in such times failed to tell the truth, even telling untruths instead, to leave room for the thought that this is not a striking instance of frankness, courage and sound judgment in meeting a situation which is psychological rather than material.

Mr. Gary says that for months the corporation has been making preparations for a diminution in business; its inventories are not large while its cash and cash resources are larger than ever before. With such a beginning, it is obvious that whatever more is required by way of adjustment will be done. Certain it is that production will be curtailed to the full extent which circumstances may require. That is yet to be seen, but it is frankly stated that the average daily bookings in October were only 18,000 tons, against 20,000 tons in September. The October rate is barely in excess of one-half the production last year, although the corporation's capacity has been increased. Mr. Gary ignored the plea which he could have made truthfully, that normally bookings are not heavy at this time of year. As to the "unfilled orders on hand," the information given does not stop with the customary statement of the tonnage at the end of the quarter, the additional statement being made that there was a decrease of 400,000 tons during October, making about 6,025,000 tons at the end of the month, contrasted with 7,603,878 tons on June 30 last, and 7,936,884 tons, showing a diminution of 24 per cent in 13 months. The steel trade well knows that the actual extent of these tonnage obligations is of minor import, but outside the steel trade, and especially in Wall street, these periodic statements of tonnage meet with profound consideration, so that the additional statement is a real instance of disinterested frankness. Not enough is known to permit an analysis of the bearing of these figures. Last fall the total may have been swelled by the optimism of buyers preponderating over the disposition of the sales departments to scale down obligations accepted, or may have been diminished from what they rightly could have been, by a preponderance in the other direction. The tonnage now reported may be regarded as swelled by the activity of sales representatives, or unduly curtailed by the extreme conservatism known to have prevailed for months among buyers.

The net earnings reported for the third quarter of the calendar year exceeded those reported for any other quarter except the immediately preceding one. Whatever the minor details may be in arriving at the statement, there is no room to suspect that methods have undergone a change for the purpose of forcing a favorable result. The outlook is that the report for the current quarter will show a large diminution, and the public is fully prepared for the result.

The example of frankness and equanimity given by the Steel Corporation is one which may well be followed throughout the ranks of the iron and steel making and consuming trade. It is no time to yield to the attractiveness of the sensational, though that spirit, akin in its way to yellow journalism, has of late had much place in industry; to recognize the kinship is the only step necessary to kill it.

TOOLS FOR THE MACHINIST.

At the recent meeting of the Machine Tool Builders' Association a member raised the inquiry as to how general was the practice of requiring all machinists to equip themselves with a set of the tools most commonly employed. He stated that at

the plant which he represented such a provision had not been in force until a short time ago, when it was established because investigation showed that it was absolutely necessary in the interests of time economy. The experience of this concern should serve as an object lesson to many manufacturers who have never given the subject serious consideration.

"The idea struck us," said this manufacturer, "that perhaps we were losing considerable, well-paid time because our machinists were not equipped with their own personal outfit of tools, which they would keep near at hand and always ready for use. We started one of them on a job requiring a screw-driver, and watched him. He made a thirty minute trip around the shop trying to borrow this simple article, none of his associates would loan to him and finally he turned up with an old file, ground down at the point to serve his purpose. Then we decided it was time to install the system."

This concern now makes a requisite to employment, the ownership of a screw-driver, monkey wrench, calipers and rule, the entire outfit costing less than the equivalent of two days' average wages. Machinists already employed have been given a certain time to equip themselves. The concern finds that the tools are well cared for and are always at the workman's elbow. It estimates that the new system will result in a considerable economy, by putting an end to the time-consuming practice of borrowing.

PROPOSED INVESTIGATION OF STEEL AND STRUCTURAL MEMBERS.

An increased appropriation has been made available for the current fiscal year for the extension of the work carried on in the past at the Watertown arsenal in the investigation of the properties of materials of construction. It is proposed to conduct this investigation along lines of the greatest practical value to users as well as manufacturers of materials. In the experimental study of steel and steel products it is proposed to begin with the metal in the ingot and thence to follow it out to the finished sections and to built members.

By authority of the ordnance department, William R. Webster, consulting engineer, and Edgar Marburg, professor of civil engineering at the University of Pennsylvania, have been engaged to co-operate in the preparation of the program of tests, and in the prosecution of the work. A meeting attended, at their invitation, by about 25 consulting engineers and representatives of leading consuming and manufacturing interests, was recently held at the Engineers' Club, New York city, for the purpose of meeting Maj. C. L. H. Ruggles, commanding officer, Watertown arsenal, and J. E. Howard, in charge of the Watertown testing laboratory, with a view of determining the most desirable program for the initiation of the proposed investigation. This meeting was held in two sessions.

One session, presided over by Dr. Charles B. Dudley, chemist, Pennsylvania railroad, was devoted to a discussion of metallurgical questions applying to ingot structure, blooms, billets, slabs and forgings, and it was the sense of the meeting that it was desirable to make a study of these questions a special feature of the proposed work.

The second session, at which J. V. W. Reynders, vice president Pennsylvania Steel Co., presided, was devoted to the consideration of a preliminary program for tests of structural members, including columns, riveted tension members, riveted splices, riveted connections in building construction and the general subject of riveting.

At the opening of the meeting Major Ruggles explained that the work was not to be regarded in any sense a government investigation of steel, but that it was the desire of the ordnance department to utilize the increased appropriation with a view not only to the needs of the government, but also to make the results as valuable as possible to all persons interested in the subject of steel, whether as consulting engineers or as representatives of consuming or manufacturing interests.

J. E. Howard, in charge of the testing laboratory at Watertown arsenal, presented in abstract his report to the ordnance department in which attention was drawn to the desirability of making provision for the extension of the usefulness of the testing laboratory, and indicating in detail numerous lines of research that might be taken up to advantage.

It was the sense of the meeting that the extension of the testing facilities in this country had not kept pace with the advance in engineering construction, and a resolution was adopted by unanimous vote that the enlargement of the present facilities at the U. S. Watertown arsenal by the erection of a testing machine of at least 10,000,000 pounds capacity was desirable. It was also decided to authorize the chairman, Dr. Dudley, to appoint two committees, subject to the approval of the Watertown authorities, one on ingot structure, billets, blooms, slabs and forgings, and the other on tests of structural materials. These committees have since been appointed and much preliminary work has already been accomplished, which will be submitted at an early date to the engineering profession for criticism and suggestions.

PRODUCTION OF COKE IN 1906.

The total production of coke from the beehive and by-product ovens of the United States in 1906 amounted to 36,401,217 short tons, against 32,231,129 short tons in 1905, an increase in 1906 of 4,170,088 short tons, or 12.94 per cent, surpassing all previous records in the history of coke making in the United States.

Of the total output 31,843,090 short tons were produced in beehive ovens against 28,768,781 short tons in 1905. The production from retort or by-product ovens in 1906 was 4,588,127 short tons against 3,462,348 tons in 1905, the increase in the production of beehive coke being 3,074,309 tons, while the increase in the retort-oven product was 1,095,779 short tons.

The value of the total coke product in 1906 increased in even greater proportion than the tonnage, from $72,476,196 in 1905 to $91,608,034 in 1906, a gain of $19,131,838, or 26 per cent, as compared with an increase of 12.94 per cent in quantity. The value of the product in 1906 was nearly double that of 1904, when the production amounted to 23,661,106 short tons, compared with which the production in 1906 shows an increase of 12,740,111 tons, a little over 50 per cent.

The quantity of coke produced in Pennsylvania in 1906 was 23,060,511 short tons out of a total for the United States of 36,401,217 short tons. In 1905 Pennsylvania produced 20,573,736 short tons out of a total of 32,231,129 tons, and in 1904 that state contributed 14,861,064 tons out of a total of 23,661,106 tons.

PROGRAM ARRANGED

For Approaching Convention of National Founders' Association.

Arrangements for the eleventh annual convention of the National Founders' Association, to be held at the Hotel Astor, New York city, Nov. 13 and 14, have been practically completed, and a very successful gathering is promised. Considerable ante-convention interest is being manifested in the choice of officers for the ensuing year and President O. P. Briggs, Minneapolis, the present head of the association, is expected to again be intrusted with the duties of that position.

One of the principal features of the convention will be a banquet to be held at the Hotel Astor at 6:30 o'clock Wednesday evening, Nov. 13. The assembled foundrymen at that time will be addressed by Hon. John C. Spooner, ex-senator from Wisconsin, and Hon. George W. Ross, of Toronto, who will touch upon present day topics of general interest.

The provisional program of the convention, as suggested by the officers, is as follows:

Call to Order.

Roll call.
Reading of minutes of last meeting.

Appointment of Committees.

Resolution committee.
Press committee.
Finance committee.

Reports of Officers.

President.
Assistant commissioner.
Treasurer.
Secretary.

Apprentices.

Report of special committe on employment of apprentices.
Report of Winona Training School committee.

Molding Machines.

Application of machines to a variety of work. (This subject will be introduced by several members who have had extended experience with the machines during the last few years.)

Congressional Legislation.

Co-operation with other national associations of employers.
Picketing, boycotting and limitation of apprentice ratio by labor unions. (This subject will be opened by George F. Monaghan, attorney for the association, and then referred to the convention for general discussion.)

Insurance.

For independent workmen.

Literature to Workmen.

To what extent shall it be disseminated?

Report of Finance Committee.

Miscellaneous.

Any member wishing to bring before the convention subjects pertaining to the welfare of the association, not heretofore touched upon, should do so at this point.

Election of Officers.

Banquet.

The association has been granted a 2 cents per mile rate within the territory of both the Central and Western Passenger Associations, and a fare of 1 1/3 rate for the round trip from the Eastern or Trunk Line Passenger Associations, effective during the convention.

SOUND FINANCIALLY

And Not Unduly Disturbed, Are Cincinnati Machinery Makers.

Office of THE IRON TRADE REVIEW,
First National Bank Bdlg.,
Cincinnati, Nov. 4.

The developments of the week in financial affairs have been of a nature calculated to disturb the whole business of the country. In canvassing the machinery trade for direct effects of the much discussed general situation, your correspondent finds that while the minds of men in this line are influenced by the same factors that influence the actions of other business interests, there is here in the machinery trade a freedom from hysteria and a disposition to regard the present conditions as more of fright than of being based on tangible ground for expectation of a protracted recession in business.

There have been cancellations and collections are not uniformly satisfactory. New business is light and purchasing has been brought to a minimum or to the limits of current needs. These are conditions which are well known to exist. Naturally, manufacturers are cautious. The question confronting these interests is as to the future. It is difficult to forecast during a period of excitement, but the deliberate views expressed by many large machine tool builders here show that they are not unduly alarmed over the situation and continue to study the underlying and fundamental business factors. It is pointed out by one manufacturer that depressions of long duration are accompanied by the accumulation of stocks of all kinds, ruinous prices, and all the attendant evils of overproduction. This is far from the situation at present. Stocks of manufactured materials are light. The high prices of all raw materials have influenced conservative buying for some time. Nearly all factories are working on unfilled orders and not piling stock. Without this burden, the manufacturer is in strong position to wait for price readjustments. In the meantime manufactured products are being consumed. The profits of past good business have placed most of the Cincinnati machine builders in good financial position to meet a waiting period, and on the whole there is inclination to regard the unsettled situation as making for ultimate good in serving as a check against the rapid expansion without sufficient financial strength.

Opinions as to how long a period of quietude may be expected are not offered. The manufacturer can only await developments and proceed on conservative lines until the outlook is more clearly defined.

The term conservative as here used does not imply or mean violent contraction. There has been but little in the way of reducing the number of operatives. Some shops are continuing right along making a little stock, which they regard as good property.

The machinery and machine tool interests here display a rational, calm, and deliberate course in meeting the unusual conditions.

STEEL PRODUCTION OF GREAT BRITAIN.

Returns supplied by manufacturers enable the British Iron Trade Association to announce that the total make of open-hearth ingots in the United Kingdom for the first half of 1907 was 2,337,794 tons, which compares with 2,196,853 tons in the first half of 1906, and with 1,980,095 tons in the first half of 1905.

In 1907 there has been an increase in every district, but most of all in North and South Wales, which is attributable to the notable prosperity of the tinplate industry.

The average make by the open-hearth furnaces at work in Great Britain in the first half of the current year was 5,963 tons, as compared with an average of 5,858 tons in the first half of 1906, so that the yearly average for 1907 has been at the rate of 11,926 tons for the twelve months, against an average for the first half of 1906 at the rate of 11,716 tons.

The total number of open-hearth furnaces in operation in the first half of 1907 has been 392, against a total of 375 furnaces employed in the first half of 1906.

The returns of the output of Bessemer steel ingots in the first half of 1907, supplied by manufacturers to the British Iron Trade Association, show a total output of 1,068,972 tons, compared with a total of 919,620 tons for the first half of 1906, and 1,019,887 tons for the first half of 1905. Of the 1907 production, 762,193 tons were by the acid process and 306,779 by the basic.

The output of Bessemer steel rails in the first half of 1907 was 452,774 tons, which is a decline of 34,410 tons, compared with the output in the first half of 1906.

OCTOBER HAS RECORD IRON PRODUCTION

In view of the number of furnace interests that are taking the present quietness in the pig iron market as an opportunity to make needed repairs to overworked stacks, the production of pig iron in the United States in October was rather larger than was to be expected, reaching 2,352,530 tons, as compared with 2,174,148 tons in September, an increase of 178,382 tons, and a total of 2,243,656 tons in August, a month of equal length. This establishes a new high record for monthly production in the United States, the largest previous output having been 2,291,030 tons in May, 1907. At the end of October the idle capacity had been greatly increased, making the average daily capacity in blast in the country at the end of the month 71,237 tons, against 72,269 tons on Sept. 30. In the early part of November a number of additional furnaces were placed in the temporarily idle class, particularly six stacks of the Carnegie Steel Co., starting November with a considerably curtailed capacity.

"A 30-day suspension will probably give us fair prices for the remainder of the year. Everybody needs a rest, particularly labor," is the way one Ohio furnace interest sizes up the situation. "Furnaces should hold for $19 to $20 furnace and bank 30 days or more if they cannot get such figures," says this producer.

The number of furnaces in the country in blast Oct. 31 was 314, or 15 less than the number active Sept. 30. The active furnaces throughout the month had an average daily production of 75,888 tons, compared with 72,372 tons throughout the month of September.

Divided as to the consumption of the product, the output in October was 743,094 tons merchant and 1,571,695 tons non-merchant.

A new addition to the furnace capacity of the country, blown in during the month, was the new furnace D of the National Tube Co. at McKeesport, which was blown in Oct. 10.

OCTOBER FURNACE REPORT.

STATE.	NO. OF STACKS	NO. IN BLAST ON LAST DAY OF MONTH. OCTOBER	NO. IN BLAST ON LAST DAY OF MONTH. SEPTEMBER	PERCENTAGE OF TOTAL POSSIBLE OUTPUT MADE.	AV. DAILY CAPACITY IN BLAST LAST DAY OF MONTH.	ACTUAL TONNAGE MADE. MERCHANT	ACTUAL TONNAGE MADE. NON-MERCHANT	TOTALS. SEPTEMBER	TOTALS. OCTOBER
Pennsylvania	157	126	135	86.9	31,689	244,453	773,165	944,346	1,017,618
Ohio	61	52	54	88.3	13,738	157,543	338,285	443,708	495,828
Alabama	46	30	29	65.3	4,824	122,122	27,603	143,257	149,724
Virginia	23	13	16	56.5	1,188	35,590	1,350	36,216	36,940
New York	24	18	19	75.0	4,889	75,434	76,159	150,270	151,593
New Jersey	11	7	8	60.9	984	——	30,342	32,133	30,342
Illinois	24	24	23	98.1	7,385	23,488	201,419	197,126	224,907
Tennessee, West Virginia, Kentucky	18	14	14	86.7	2,543	46,722	31,883	69,638	78,605
	4	4	4						
	7	4	4						
Maryland, Wisconsin, Colorado, Indiana	4	4	4	93.5	3,246	14,998	91,489	103,130	106,487
	6	5	6						
	6	5	5						
	1	1	1						
Georgia, Texas, Minnesota, Michigan, Missouri	2	1	1	76.0	751	22,744	——	21,926	22,744
	3	2	2						
	1	1	1						
	2	2	2						
	1	1	1						
Spiegel—All states								18,066	28,074
Ferro—All states								12,448	9,668
Totals	401	314	329	——	71,237	743,094	1,571,695	2,174,148	2,352,530

MACHINE TOOLS INACTIVE.

New York, Nov. 5.

With retrenchment announcements frequent and many industrial plants closing down or operating only on short time, the current market for machine tools is naturally not active. Manufacturers and dealers are paying more attention to collections than to the sale of additional machines and are finding this a difficult task in view of the financial situation. Few new projects are in prospect and it appears that the winter will be quiet, so far as new business is concerned. The stocks of accumulated orders are rapidly being cleared away and excellent deliveries are now obtainable in practically all lines.

A fair demand is noted, however, for engines, a number of good sales having been closed recently. Tenders are in for power plant installations for the Hebrew Infant Asylum and for the Long Island City Hospital.

The Pacific Iron Works, Inc., Bridgeport, Conn., in order to care for its extensive railway work, is preparing to install a large brass foundry, to occupy the old boiler shop at the works. The brass foundry will be installed and operated under a different corporate name, but will be controlled by the same interests as the Pacific Works.

Steel Committees Meet.—Steel committees from Cleveland, Pittsburg, Wheeling, Johnstown, Erie and Shenango held a joint meeting at Buffalo last week with the New York state committee. Samuel L. Seymour, of Pittsburg, division general freight agent of the Pennsylvania, was re-elected chairman, and W. H. Smith, division freight agent of the Lake Shore at Cleveland, was made secretary. No particular change was made in the rates except to adjust them.

PERSONAL.

R. S. Cornelius, of Grand Rapids, Mich., has taken the position of general manager of the Wolverine Brass Works, Chatham, Ont.

Dr. H. M. Payne has been elected dean of the department of mining engineering, recently inaugurated by the University of West Virginia.

B. F. Jones Jr. and James Laughlin, of the Jones & Laughlin Steel Co., are among the incorporators of the Ross Land Co., Pittsburg, which has just been granted a charter.

C. M. Shank, superintendent of the H. C. Frick Coke Co., Lemont, Pa., has resigned and has been succeeded by Benton Boyd, superintendent of the Continental No. 2 plant.

Percival Roberts Jr. has been elected a director of the Pennsylvania railroad to succeed A. M. Fox, deceased. Mr. Roberts was for many years at the head of the Pencoyd Iron Works.

C. C. Major, formerly connected with the engineering drawing department of the Ohio State University, has resigned to become chief engineer to the Midgley Mfg. Co, Columbus, O.

T. L. Fornham succeeds F. E. Austin as Pittsburg district sales manager of the Platt Iron Works Co., the latter having become associated with the Pittsburg branch of the International Steam Pump Co.

Charles N. Dannals, it is announced, has been appointed district sales agent in charge of the Atlanta office of the Jones & Laughlin Steel Co., vice Frank Harrison, who has resigned.

Geo. L. L. Davis, formerly in charge of the New York office of the General Castings Co., has been appointed manager of sales for the railway supply department of the U. S. Metal & Mfg. Co., 25 Broad street, New York.

E. W. Moore, manager of the Galena Iron Works Co., Platteville, Wis., has resigned to accept the position of department manager of the Temple-Ingersoll electric-air drill, manufactured by the Ingersoll-Rand Co.

W. W. Wallace, general manager ofthe William J. Oliver Mfg. Co., Knoxville, Tenn., manufacturer of mining and contractors' equipment, has resigned, and the position of general manager will be abolished.

L. W. Trumbull, professor of mining at the University of Wyoming, has resigned to devote his attention to supervising properties in Sierra county, Cal. His permanent address after Dec. 1 will be Downeyville, Cal.

Rollo H. McCoy has been appointed sales manager of the Monmouth Plow Co., Monmouth, Ill. Mr. McCoy was formerly connected with the implement manufacturing business in Monmouth, later engaging in other business in Milwaukee.

Walter W. Whitehouse, who for the past eight years has been connected in an official capacity with the machine shop of the National Tube Co., Lorain, O., has resigned. Mr. Whitehouse is president of the board of public service of Lorain.

Frank H. Russell, for many years salesman for Jos. T. Ryerson & Son, Chicago, and son-in-law of W. E. Stockton, of the Norwalk Iron & Steel Co., was shot while returning home on the night of Oct 10 supposedly by burglars. He was found dead in the morning.

William J. Penhallegon, superintendent of the Manitou Mining Co. and the Frontenac Copper Co., subsidiary companies of the Calumet & Hecla Mining Co., has resigned to accept the position of assistant general manager of the Tennessee Coal, Iron & Railroad Co. He will have charge of the coal mining division with headquarters at Birmingham, Ala.

John Sample Jr., cashier of the Jones & Laughlin Steel Co., Pittsburg, and one of the veteran employes of that company, has retired at the age of 72. Mr. Sample had spent 38 years of continuous service in the Jones & Laughlin general offices. Upon his retirement Mr. Sample was presented with a handsome watch from the company and a library chair and reading lamp from his former fellow employes.

J. A. Jeffrey, president of the Jeffrey Mfg. Co., Columbus, is at the head of the Commercial Improvement Co., a new $1,000,000 corporation, which will handle and improve business real estate in Columbus on a large scale. With Mr. Jeffrey in the new enterprise are associated Robert H. Jeffrey, vice president of the Jeffrey Mfg. Co., and J. Walter Jeffrey, general manager of the Ohio Malleable Iron Co.

OBITUARIES.

Franklin B. Polson, president of the Polson Iron Works, Toronto, Ont., died suddenly at his home in Toronto, Oct. 28, at the age of 50 years. He was born at Port Hope, Ont., and after a long experience as an engineer, with his father he founded in 1883 the Polson Iron Works, which has developed into one of the largest engineering and ship building plants in Canada.

Harvey Graham, assistant general manager and director of the Nova Scotia Steel Co., died on Oct. 30, at his home in New Glasgow, N. S., after an illness of about one year. He had been associated with the coal, iron and steel industries of the province for many years and was prominent in connection with religious and political life, as well as in commerical affairs.

John C. Kruse, superintendent for the Oliver Iron Mining Co. at one of its Iron Mountain mines, was accidentally killed while hunting Nov. 1. He had long been in the employ of the Steel Corporation and is from a family of mining men. His brother, Chas. T. Krause, of Ishpeming, is assistant general manager of the Interstate Iron Co., the mining subsidiary of Jones & Laughlin.

RECORD PRODUCTION FOR ILLINOIS STEEL CO. IN OCTOBER.

It has been a characteristic feature of the last quarter that mills working on a variety of different products have been turning out material at a remarkable rate and in contrast to the market dullness. It is not altogether unexpected, therefore, that he Illinois Seel Co. should exceed all of its previous records, but it is under any circumstances a notable performance to break records in every individual department in all three works, South Chicago, Milwaukee and Joliet. Following are the actual records with comparisons:

Illinois Steel Co. October Production Records.

	Record Period.	October, 1907, Record.	Best Previous Record.
		Tons.	*Tons.*
South Works—			
Blast furnaces	Month	127,078	124,931
Bessemer ingots	24 hours	4,155	3,981
Bessemer ingots	Month	98,183	96,469
Basic ingots	Month	80,661	79,888
Total ingots	Month	178,844	176,357
Rail mill	Month	77,548	74,959
Blooming mill No. 1	Month	38,180	36,621
Structural mill	Month	21,730	21,043
Total finished product	Month	133,259	123,314
Milwaukee Works—			
8-inch train	Month	3,611	3,070
No. 1 9-inch train	Month	3,405	3,333
No. 2 9-inch train	Month	4,368	4,138
12-inch train	Month	6,724	4,489
21-inch train	Month	6,430	5,767
All mills	Month	29,078	26,402
Joliet Works—			
Blast furnaces	Month	47,742	47,186

NEW SAUCON PLANT OF BETHLEHEM STEEL CO.

Comprises a Rail Mill, Structural Mill, and Beam Mill, the Latter Built Under the Grey Patents

The new 28-inch rail mill of the Bethlehem Steel Co., South Bethlehem, Pa., is now in operation. The starting of this mill throws into operation the first unit of the new $12,000,000 plant begun a little over a year ago by this company. The second unit which consists of a 48-inch Grey universal beam mill will start about Nov. 1 and the third unit, a 28-inch structural mill, will begin operations sometime about the first of next year. The new plant is located about one-mile east of the blast furnaces of the Bethlehem Steel Co., and consists at the present time of ten 50-ton basic open-hearth furnaces, one 48-inch blooming mill, one 46-inch blooming mill, one 28-inch rail mill with three stands of 3-high rolls and two stands of 3-high pinions, which is also adapted for the rolling of structural shapes; a 28-inch structural mill with three stands of 3-high rolls and one stand of 3-high pinions, and the Grey universal beam mill which, aside from the 46-inch blooming mill, contains two 48-inch Grey beam mills. The output of the rail mill will be confined exclusively to low phosphorus open-hearth rails. Special attention will also be devoted to the production of nickel, nickel-chrome, vanadium and other special grades of alloy, steel rails. The Grey universal beam mills will be put into operation this month, and it is the intention to accumulate a fair amount of stock of several sizes of these new shapes before placing them generally on the market. Orders, however, are now being booked for a tonnage of several of these sections for shipment in December or earlier.

The open-hearth building is 158 x 891 feet and contains ten 50-ton basic exceptionally heavy, open-hearth furnaces. Five of these furnaces are now in operation and the remainder will be blown in as soon as the requirements of the plant demand additional material.

The original plans of the Bethlehem Steel Co. in connection with the new Saucon plant call for two distinct units, each composed of 12 50-ton furnaces. When conditions demand increased capacity, two furnaces will be added to the present incomplete unit and the 12 furnaces of the second unit called for by the plans will be erected.

A 250-ton hot metal mixer is installed at the west end of the open-hearth building, and directly in line with the battery of furnaces. Hot metal from this mixer, which itself is supplied by 35-ton ladle cars transferring the metal from the blast furnaces, will be handled by two 60-ton electric ladle cranes over the charging floor. Two Morgan low type electric charging machines will be used for charging the furnaces.

On the pouring floor, 70-ton ladles will be used, the 70 feet clearance on the pouring side of the furnace being taken up by three 100-ton ladle cranes built by the Alliance Machine Co.

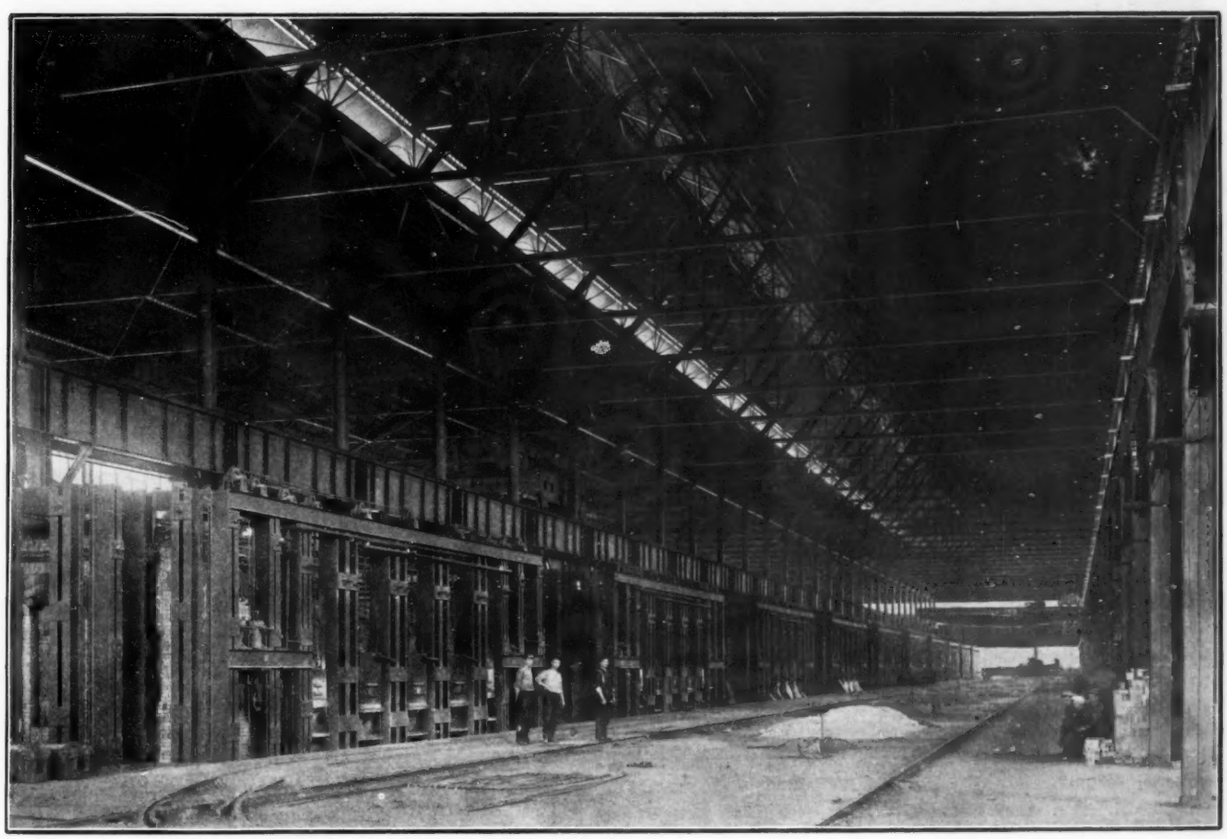


FIG. 1—CHARGING SIDE OF OPEN-HEARTH FURNACES, SAUCON PLANT, BETHLEHEM STEEL CO.

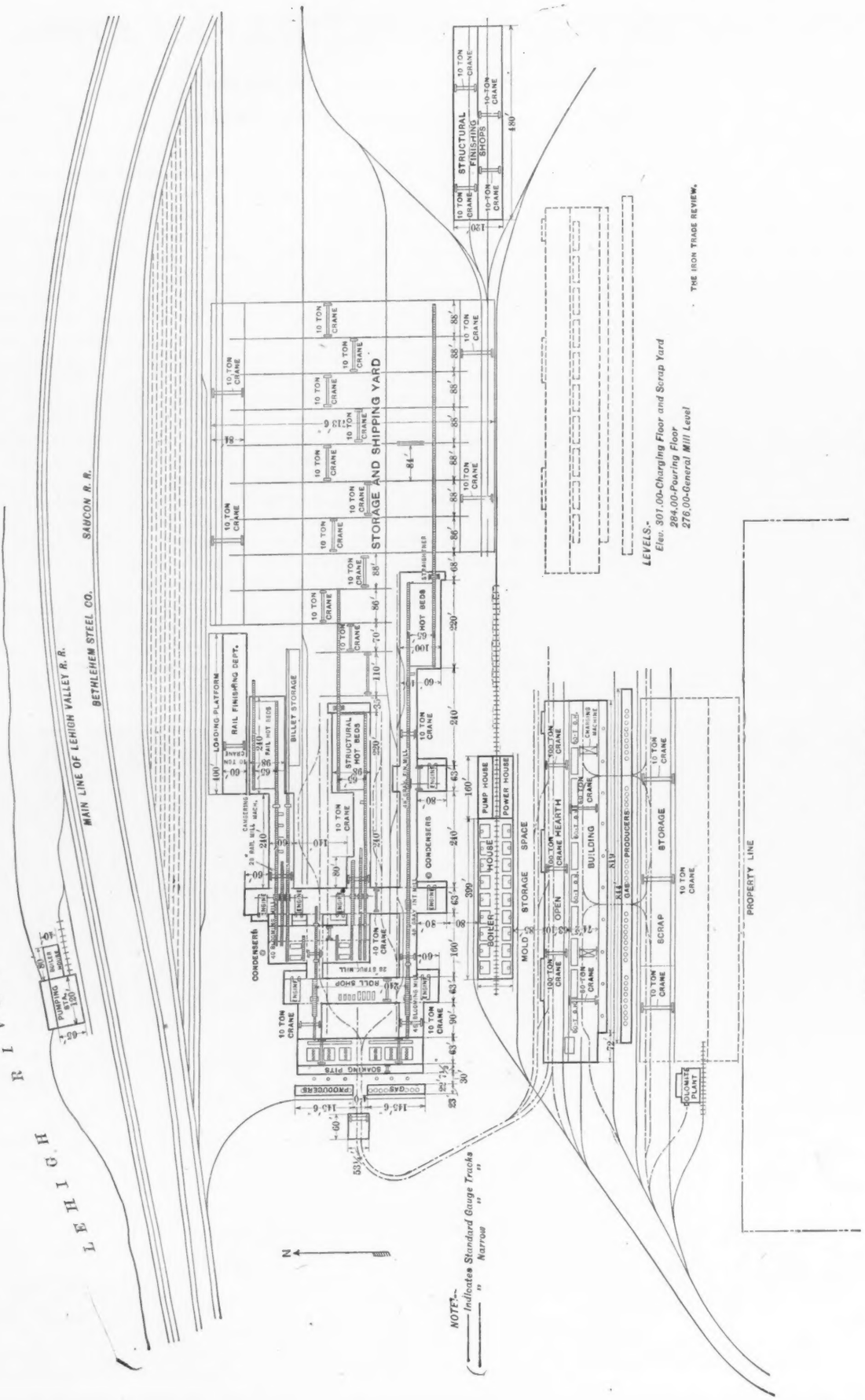


FIG. 2—GENERAL PLAN OF NEW SAUCON PLANT OF BETHLEHEM STEEL CO.

In the erection of this building, liberal space was allowed on both sides of the furnaces, 60 feet clearance being allowed on the pouring or pit side, and a clearance of 70 feet on the charging side served by the respective 60- and 100-ton electric cranes mentioned.

Gas for the furnaces is supplied by 45 Laughlin gas producers, each 10 feet 3 inches diameter by 14 feet high with 13½-inch lining. The building itself is 23 feet x 844 feet.

In making this installation the age yard 900 feet long and 84 feet wide, covered by three 10-ton electric cranes. Provision has been made for two additional parallel scrap storage yards when the open-hearth units are completed, according to original plans.

To the north of the open-hearth building and between it and the boiler house is the ingot mold storage space, commanded by an overhead electric crane, and equipped with narrow gage tracks. From the pouring pit of the open-hearth building the ingots are taken by narrow gage railproducers similar in size and construction to those in the open-hearth building.

The 40-Inch Blooming Mill.

The 40-inch blooming mill serves the 28-inch structural mill and the 28-inch rail mill. This mill, which is driven by a 40 and 66 x 54-inch twin tandem-compound reversing engine with gear connections, was built by the Mesta Machine Co. of Pittsburg. The engine was built by the Wm. Tod Co. of Youngstown, O. The Mesta

FIG. 3—POURING SIDE OF OPEN-HEARTH FURNACES, SAUCON PLANT, BETHLEHEM STEEL CO.

Bethlehem Steel Co. experimented on its producer capacity, operating some of the furnaces with gas from four producers and others with gas from five producers. It has been definitely determined that the latter is the more economical.

The open-hearth gas producers, as well as those supplying the soaking pits of the finishing mills, are equipped with the Heyl & Paterson overhead coal bins and coal conveying and ash handling apparatus.

To the south of the gas producer house and between it and the company's property line, is a scrap storway to the stripper building at the head of a series of two blooming mills, a 28-inch rail mill, a 28-inch structural mill and a 48-inch Grey structural mill.

After being stripped of the mold, the ingot is taken to the soaking pits, which consist of six 4-hole soaking pits, three on either side of the narrow gage ingot tracks. The stripper is served by a 100-ton stripping crane, and the soaking pits by two 10-ton electric cranes, while a 5-ton electric crane serves on the runway over the gas valves. The gas for these soaking pits is furnished by 20 Laughlin

Machine Co. built the blooming mill complete, its installation consisting of approach tables, run-out tables, an 800-ton hydraulic up-cut shear and a three-cylinder hydraulic shear with the necessary shear tables, shear delivery, and weighing tables complete with loader and push-off, together with the necessary scrap handling devices. The Mesta Machine Co. also furnished the necessary accumulators and intensifiers to handle this installation. The 40-inch blooming mill housings weigh 105,000 pounds each. The Bethlehem Steel Co. built its own 46-inch blooming mill installation, while the mill

tables and manipulators together with an 800-ton hydraulic up-cut shear were furnished by the Mesta Machine Co. The blooming mill tables are commanded by overhead cranes, of 25-tons capacity on the finishing side, and 10 tons on the approach side. A modified Wellman-Kennedy manipulator is provided. There are two pusher bars on each side of the mill, each 2 feet 6 inches high and 24 feet long. These are steel castings, which carry on their faces heavy steel wearing plates. The operating mechanism is located underneath and at one side of the tables and consists of transverse racks working in opposite directions and deriving their motion from two pairs of hydraulic cylinders on each side of the mill. The manipulators on the approach and finishing sides of the mill, respectively, are connected by shafts, compelling them to work in unison. The piece being worked is turned by means of a tumbler, the principal element of which is a square rocker shaft connected to a lever arm and actuated by a hydraulic cylinder. The tumbler bars slide with the manipulator bars, a vertical motion being given them as the square shaft rocks.

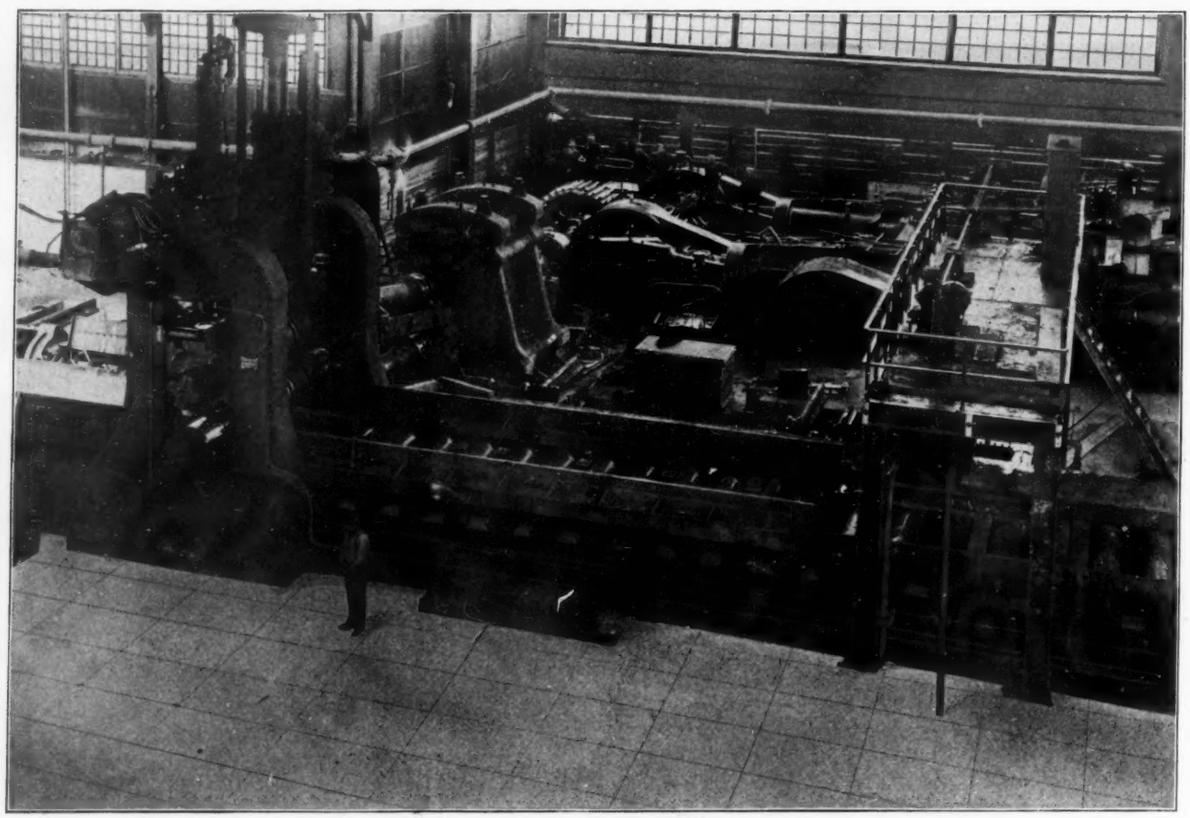


FIG. 4—40-INCH BLOOMING MILL AND ENGINE, SAUCON PLANT, BETHLEHEM STEEL CO.

800-Ton Shear.

The blooming mill shear mentioned above was designed by Henry Grey & Son and built by the Mesta Machine Co. It is shown in the illustration, Fig. 5, together with the intensifier. The width of the knife holder is 5 feet and the stroke is 18 inches. But one operating cylinder is provided, which is fitted with a 40-inch plunger. The pressure on the line is 500 pounds, and this may be used, or a pressure of 1,500 pounds may be secured by means of the intensifier. The working cylinder supports the top knife, which is carried by two side cylinders, which raise or lower the working cylinder, and with it the top knife, by the admission of water. The stroke of the side cylinders is regulated by two screws driven by an electric motor. This construction differs from the usual one in that the screws are not subjected to any of the shearing pressure. The water is economized by the use of the floating top knife and rapidity of action is secured, since the top and bottom knives are only separated by the thickness of the piece being cut and a small amount for clearance. Two 14-inch bolts connect the bottom knife holder to the upper cross head, which is an integral part of the plunger of the working cylinder.

The Bloom Transfer.

The bloom transfer crane is of 10 tons capacity, and moves at right angles to the tables. This permits it to take blooms either to the rail mill or to the structural mill. Three vertical racks on the crane frame carrying heavy hooks for picking up the blooms are provided for hoisting. The blooms are elevated above the table by apron plates between the rollers, as shown in the illustration, Fig. 6. The plates are mounted on hydraulic jacks operated from the same pulpit from which the shear is controlled. As the bloom is held above the roller, it is picked off the aprons by the crane hooks, whence it can be taken to the approach table of the rail mill roughing train, or to a table in front of a Laughlin continuous furnace 17 x 40 feet, into which it may be introduced by an electric pusher. Upon discharge by gravity at the outlet end of the furnace, it falls upon the roller table leading to the roughing stand of the rail mill.

Blooming Mill Engine.

The engine for the 46-inch bloomer of the Grey patent beam mill is a duplicate of the 40-inch blooming mill engine and was built by the Wm. Tod Co. of Youngstown.

The cylinders of this engine are 40 and 66 inches diameter by 54 inches stroke. The cylinders are separately

attached to the bed plate, allowing free expansion. In order to relieve the unbalanced pressure of exhaust, all valves are made in tubular form and the low pressure cylinders are fitted with twin valves. The links of the valve gear are connected to the pulpit, which enables the operator to place them in a position for early cut off. Three throttle valves are provided, operated by a floating steam gear. In addition, there is a device for automatically maintaining steam pressure in the receiver when the engine is not in operation. All shafts are of nickel steel, and the jack shaft is equipped with crabs on both ends. It will have a capacity of 400 tons of shapes per day.

This mill is driven by a Mesta Machine Co., 32 x 56 x 50-inch twin tandem-compound reversing engine. The mills with tables, shears, hot bed, etc., complete, aside from the engine, were built by the United Engineering & Foundry Co., Pittsburg.

28-Inch Rail Mill.

The 28-inch rail mill consists of three stands of three-high rolls, with two stands of three-high pinions, this arrangement being adopted to allow of rolling either three length rails or structural shapes, as desired. All three tables (C-F and K) on the delivery side of the mill are made tilting for the same reason. (See insert.)

When rolling rails, which is done in 11 passes, the roughing stand is run two-high by a 32 and 56 x 50-inch Mesta twin tandem-compound piston valve reversing engine. The intermediate and finishing stands are run three and two-high, respectively—a dummy roll being used in the top of the finishing stand—by a 44 and 76 x 60-inch cross-compound automatic piston-valve engine built by the Mesta Machine Co. The double bearing frame of this engine weighs 210,000 pounds. The single bearing frame weighs 165,000 pounds, and the fly wheel weighs 200,000 pounds.

Billets for this mill are taken by a traveling crane from the 40-inch blooming mill shear table and dropped onto table A in line with the first stand of the mill, connecting with table B, which delivers the billets to the roughing stand having five passes. The billet is handled on either side of the mill by hydraulic manipulators attached to and forming part of tables B and C. The company intends to transfer its blooms from the shear of the 40-inch blooming mill table by crane to the roughing mill delivery table, although four continuous heating furnaces of the Laughlin type have been installed, two of which are provided for the structural mill and two for supplying the rail mill. These furnaces, according to the plans of the company, will only be used in cases of emergency when the hot metal cannot be handled from the blooming mill shear table to the roughing mill approach table by means of the crane.

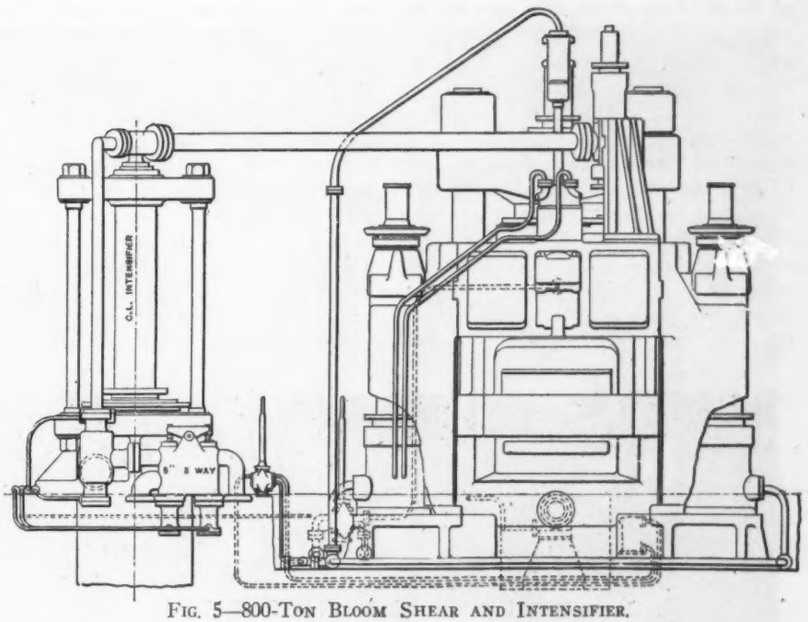


FIG. 5—800-TON BLOOM SHEAR AND INTENSIFIER.

In line with table C on the delivery side of this stand is table D, from which the rail is transfered by means of a hydraulic transfer, to table E, in line with which is table F leading to an intermediate stand having five passes. Table F is arranged to handle the piece automatically by means of levers and collared rollers. The first pass in this stand, which is No. 6, enters the middle and top, being delivered to table G and turned over to enter No. 7, the dummy pass, by an angle chute on table G.

By means of collared table rollers and levers operated automatically by the rising of the table, the piece is turned up to enter No. 8 pass, from which it falls to table G, the end nearest the mill, being pushed over as it falls by means of a guide on table to enter No. 9 pass. No. 10 pass takes the rail from table F to table G. As usual, two No. 11, or leading passes are provided, the automatic push over levers on table F being arranged so as to be easily adjusted to deliver to either pass.

Table G is extended by the idler table H, as is table J by idler table I. Between G and H and J and I is a hydraulic transfer similar to the one between D and E, except that it has two cylinders.

From table K on the delivery side

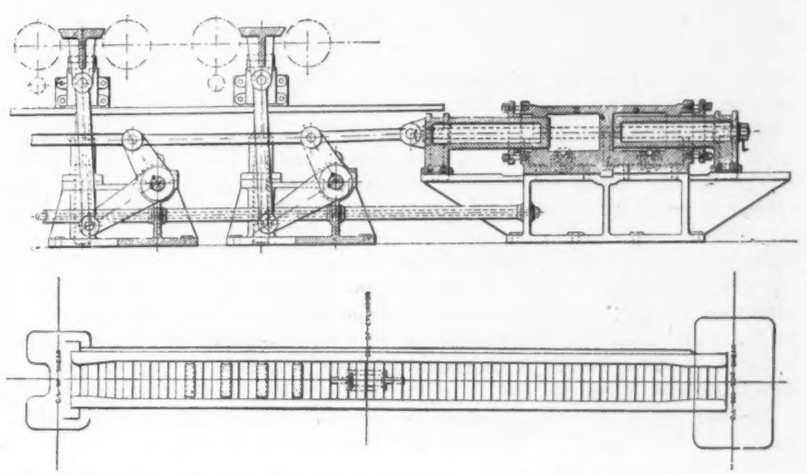


FIG. 6—PLAN AND PARTIAL ELEVATION OF LIFTING JACKS FOR BLOOM SHEAR TABLE.

of the finishing stand, rails pass to the saw table L, which is provided with grooved rollers for rails on the side next to the saws. The rails are guided into these by adjustable switches, which can be set to throw structural shapes to the opposite side of the table. The four rail saws are of the drop type, motor-driven, and are fed to the work by hydraulic cylinders operating a hollow shaft and sliding on shoes to cut either 30 or 33 feet lengths of rails. A 54-inch sliding frame, motor-driven hot saw operated by hydraulic cylinders, is provided for structural shapes beyond which is placed the machine for stamping the heat numbers on rails.

The motor-driven cambering machine, which is mounted on shoes, and is movable by means of a hydraulic cylinder, has attached to it a table roller with a short section of side shaft, which, when the cambering machine is pulled out of line, forms an extension to table L for use on structural shapes. The cambering table M is made of extra width to accommodate cambered rails.

The hot bed table N is immediately connected with table M. Leading off from this table are six hot beds. The pull-on on each of these tables consists of a 15-inch channel, each pull-on being driven by a 50-horsepower motor driving a 7-inch shaft. This driving shaft is arranged with clutches, so that three hot beds may be connected together when working on structural material. The pull-off consists of two carriages to each section of hot bed, driven in the same manner as the pull-on, and also arranged to be driven either separately or in sections of three. Rails are delivered from the hot beds to run-out table P, at the end of which is table R provided with a stop.

A special traveling crane takes the rails from table R and conveys them from the hot bed building to the finishing building. This special crane with its load are carried by a transfer bridge, shown in Fig. 10. The bridge has a span 36 feet 6 inches and commands the loading skids at one end of the hot bed building. A line shaft driven by a 7½-horsepower motor operates it. The speed of the bridge, and also that of the rail distributing crane is 300 feet per minute. The rail distributing crane has a span of 10 feet 6 inches and the members comprise two 24-inch I-beams resting on wheels. The framework carries the hoisting mechanism, consisting of three vertical racks carrying six rail hooks, the racks being operated from a line shaft geared to a 24-horsepower motor. The hoisting speed is 30 feet per minute. Both bridge and distributing crane are operated by one man, the cage being carried by the rail distributing crane. The dead load of the hoisting mechanism is balanced by counterewights. An automatic controller holds the transfer bridge in line with the runway of the distributing crane, while the latter is carrying rails and is depositing them upon the skids adjoining the straightening presses.

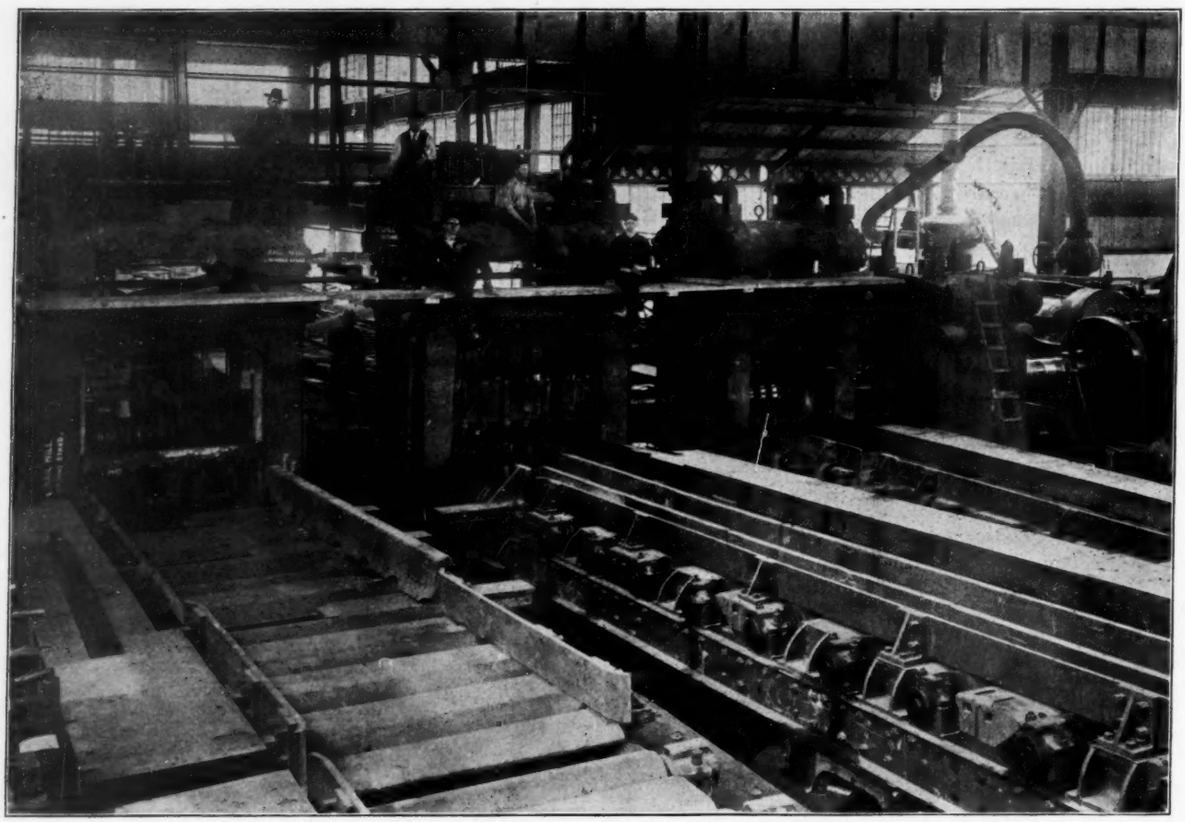


FIG. 7—ROUGHING, INTERMEDIATE AND FINISHING STANDS OF 28-INCH RAIL MILL, BETHLEHEM STEEL CO.

This traveling crane delivers rails to any point in the finishing department which is equipped with 12 motor-driven straightening presses, 12 motor-driven drill presses, and a motor-driven cold saw, with the necessary beds and a conveyor table delivering rails to any point on the shipping platform.

All machinery in this mill except the engines, drill presses and cranes, was

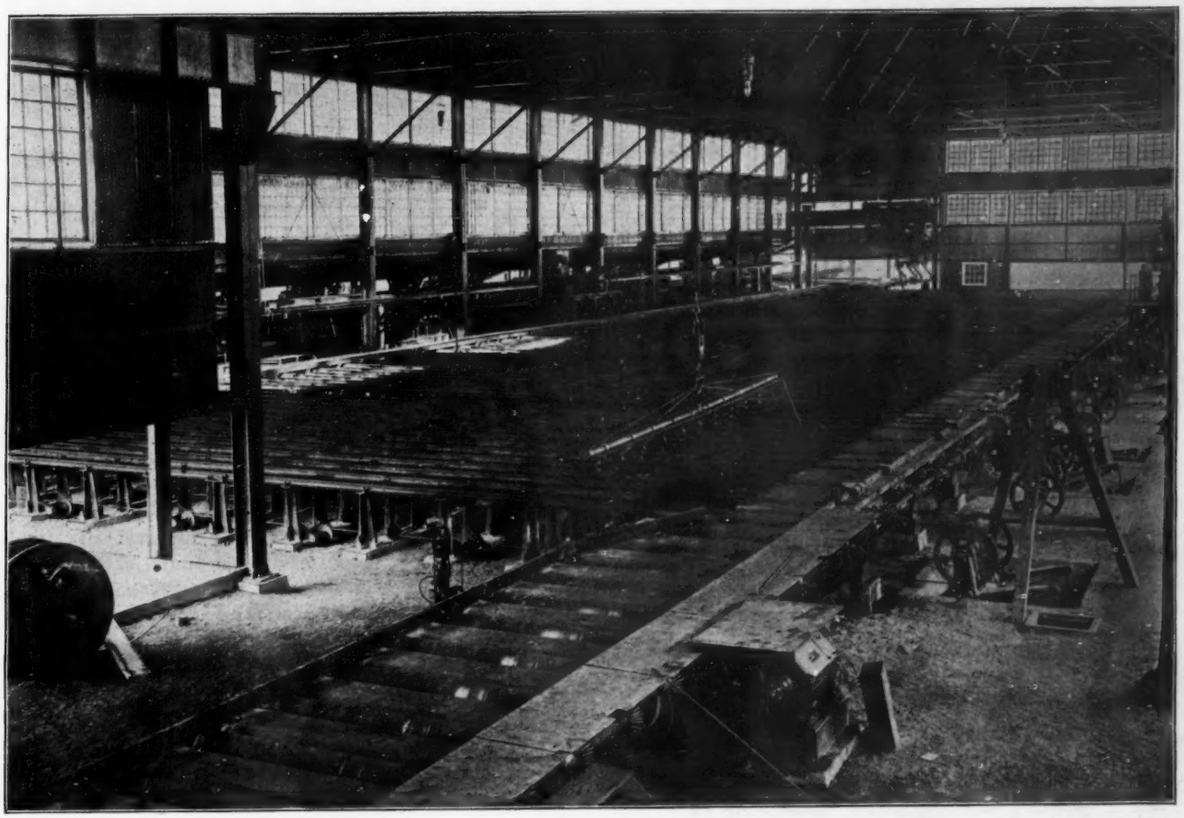


FIG. 8—INTERIOR OF RAIL FINISHING MILL, BETHLEHEM STEEL CO.

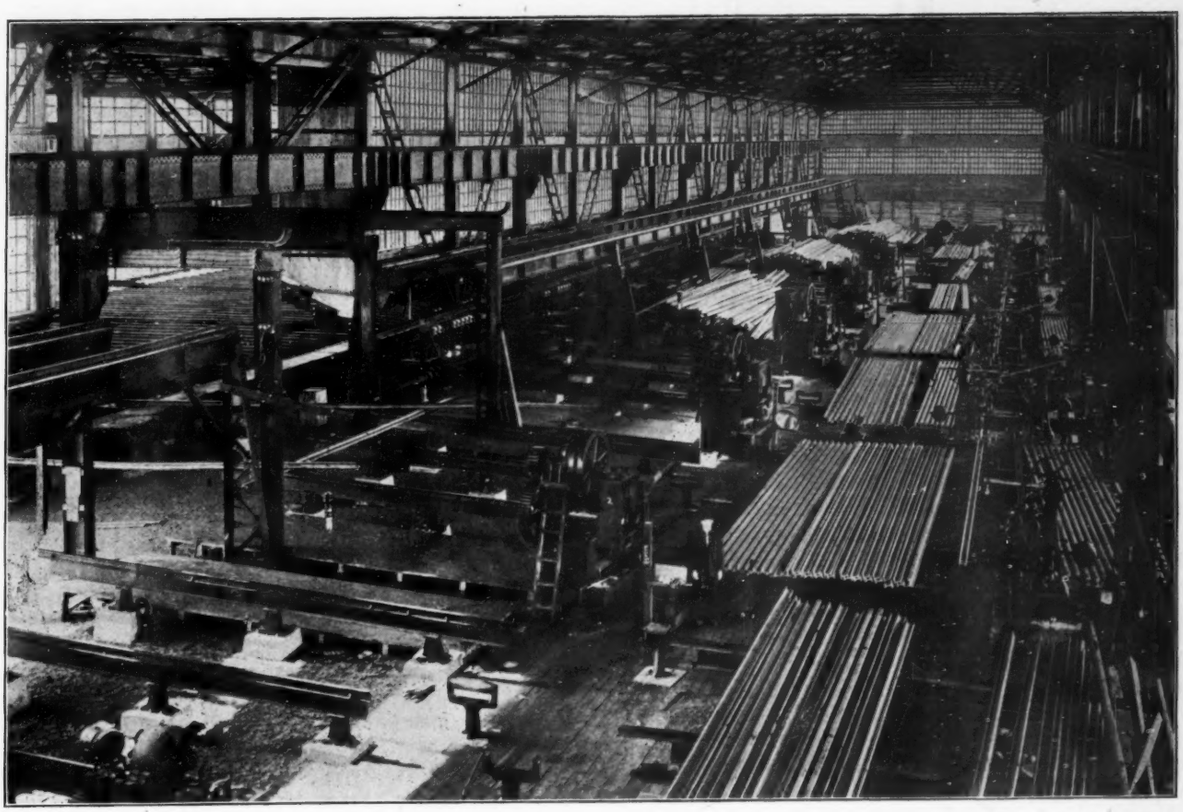


FIG. 9—HOT BEDS OF NEW RAIL MILLS, BETHLEHEM STEEL CO.

furnished by the United Engineering & Foundry Co.

28-Inch Structural Mill.

This mill consists of three stands of three-high rolls, and one stand of three-high pinions, driven by a 32 and 56 x 50-inch Mesta twin tandem-compound piston valve reversing engine. The mill has top and bottom screws on all housings.

Billets for this mill are taken by a traveling crane from the 40-inch blooming mill shear table and dropped on a table in front of two Laughlin continuous furnaces from which they are pushed into either one of the two furnaces. They fall from the furnace onto table A in line with the first stand of the mill. Table A is connected with table B, which delivers the billet to the roughing stand, the billet being handled on either side of the mill by hydraulic manipulators attached to and forming part of tables B and C, which are both tilting.

In line with table C on the delivery side of this stand is table D, from which the piece is tranferred by means of a hydraulic transfer to table E, which has an extension marked H-2 formed of apron plates only, no rollers being used, to take care of the long pieces on the last pass of the intermediate stand. Tilting table F is in line with table E. On the opposite side of the intermediate stand is table G to which table H, an idler table, forms an extension. From tables G and H the piece is transferred by a hydraulic transfer similar to the one between tables D and E, except that it has two cylinders, to tables I and J, of which I is an idler table, and J a driven table, entering the piece in the finishing stand. Table K on the delivery side of the finishing stand is a tilting table. On tables F, G. J and K, hydraulic pushers are provided for pushing the piece in line with the different passes.

The saw table L, in line with table K, leads the piece to a 54-inch sliding-frame, motor-driven hot saw, fed by hydraulic cylinders. Connecting with table L is the hot bed table M and two pull-ons, the latter consisting of 15-inch channels. Each pull-on is driven by 50-horsepower motor driving a 7-inch shaft. This driving shaft is arranged with clutches, so that the pull-ons may be worked either separately or together. The pull-off consists of six carriages to each section of bed, driven in the same manner as the pull-on, and also arranged to be driven three together or six together. Material is delivered from the hot beds to run-out table P, at the end of which is a double eight-roll straightening machine. The rolls in one machine are provided with grooves for angles, and in the other machine with grooves for beams and channels.

A short section of table is placed between these machines, the whole being arranged to slide on shoes by means of a hydraulic cylinder, so that either machine may be used, or material may be run onto table R without straightening. Material is handled off table R by traveling cranes to the storage and shipping yard.

All the machinery in this mill, except the engines and cranes, was furnished by the United Engineering & Foundry Co.

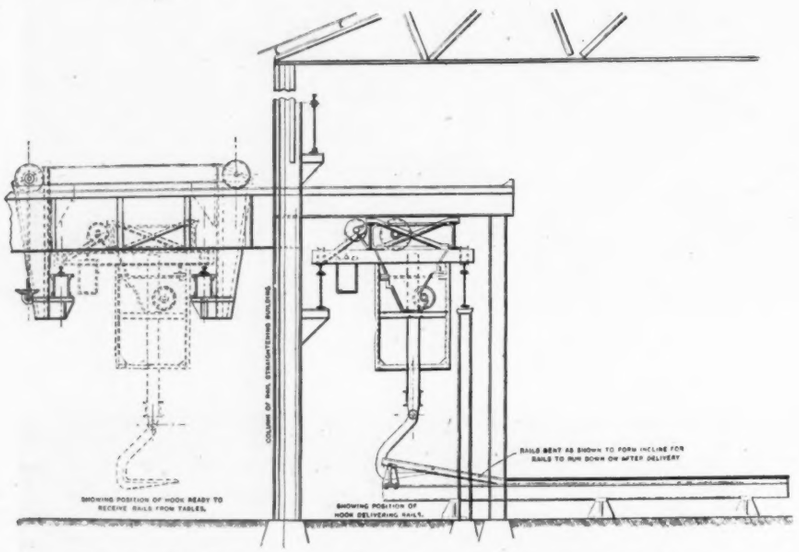
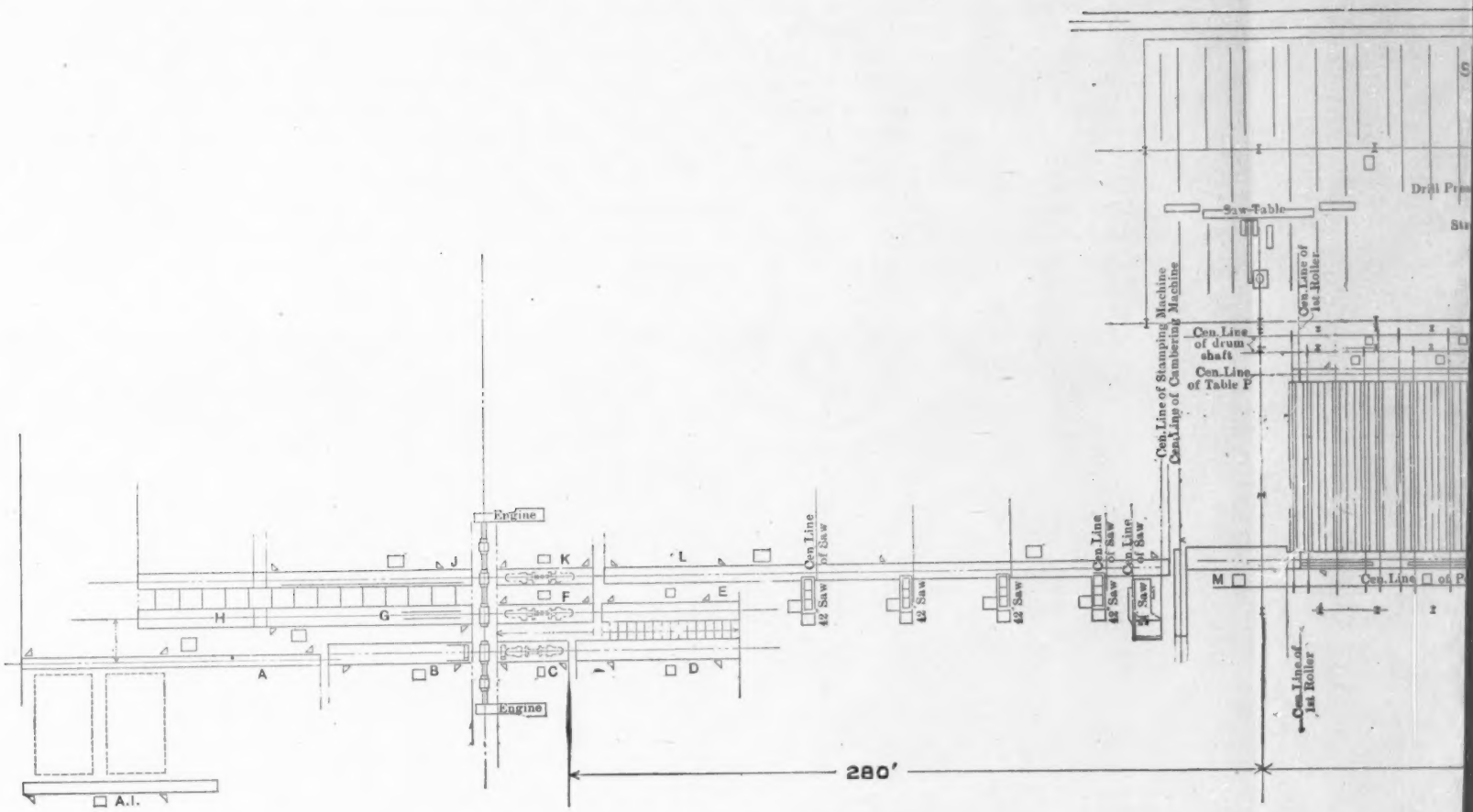


FIG. 10—HOT BED TRANSFER BRIDGE AND RAIL DISTRIBUTING CRANE.

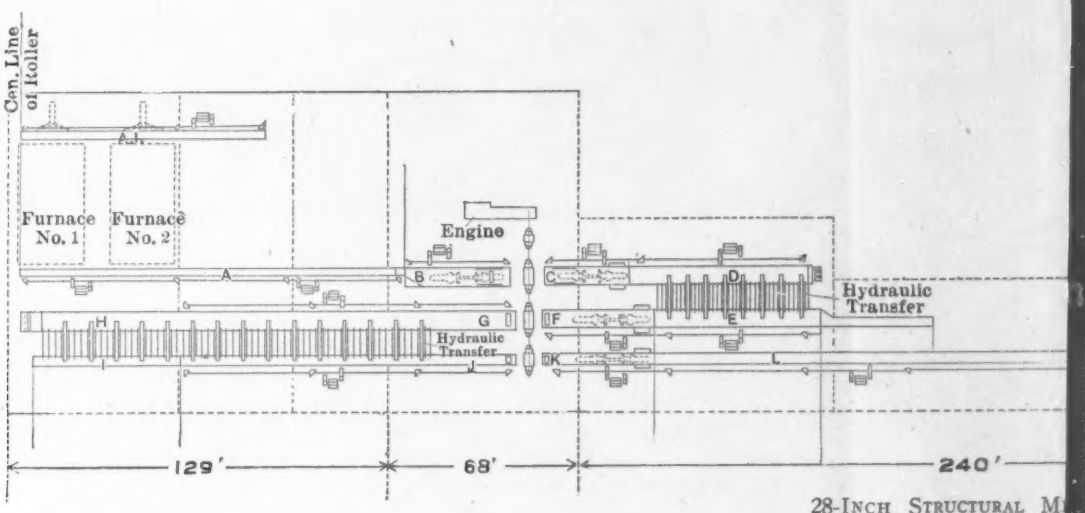
Grey Universal Beam Mill

The remaining portion of the new plant is devoted to the production of wide flange beam sections by the Grey patent universal mill method, the American rights of which are controlled by the Bethlehem Steel Co. While this method is new to this country, it is, however, an American invention developed and perfected by Henry Grey, of New York. The process is well known abroad, where a somewhat similar mill designed and built by Mr. Grey has been in successful operation since 1902 at the Differdingen works of the German-Luxemburgian Mining & Rolling Mill Co. This German mill of the Grey type is now producing from 10,000 tons to 15,000 tons a month of wide flange beam sections exclusively.

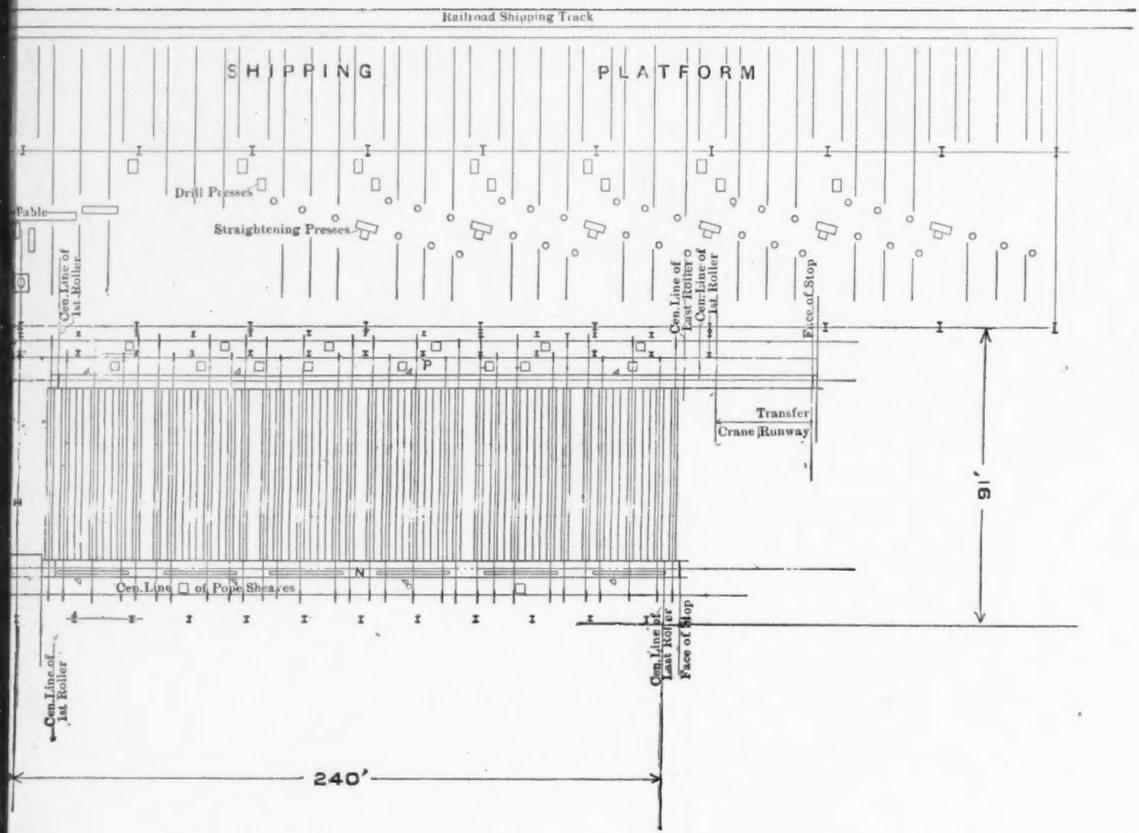
The Grey mill works consist of a 46-inch blooming mill and two 48-inch Grey beam mills. These three mills are arranged tandem for continuous production from the ingot to the finished shape without reheating. A 40 and 66 x 54-inch twin tandem-compound reversing engine with geared connection drives the blooming mill. This engine was built by the William Tod Co. of Youngstown. From the blooming mill the blooms pass through a hydraulic shear, where the ends are cropped and are then delivered to the first or intermediate Grey mill and then to the second or finishing mill. Each of these mills is driven by twin tandem-compound reversing engines, exact duplicates of the 46-inch blooming mill engine except that they are direct-connected to the mills. All parts of the Grey mill works are commanded by overhead electric traveling cranes. After being hot sawed to length, the beams pass to a water cooled hot bed of liberal area. A driven roller table from the straightener extends the full width of the storage yard for finished shapes and later will be extended for delivering beams direct from the mill to the finishing shop. The mills and mill equipment of the Grey works were built by the company in its own shops, except the three engines, which were furnished by the William Tod Co., Youngstown. These mills are now practically completed with the exception of the electric wiring, hydraulic piping and a few other minor details. The general arrangement of this part of the works is shown on the ground plan of the plant. A structural finishing shop, 120 x 480 feet, is under construction, and will contain

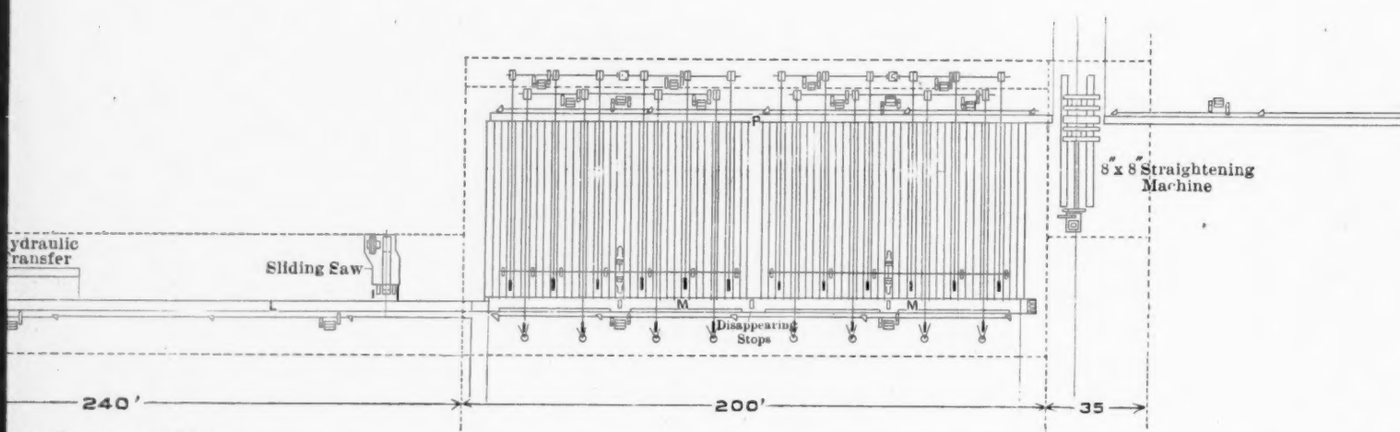


RAIL MILL.

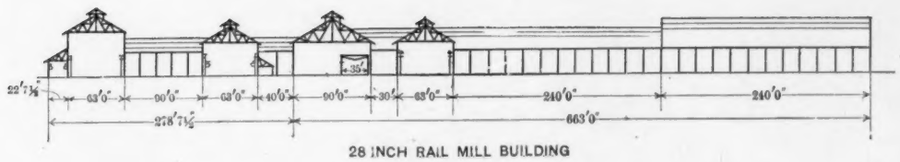


28-INCH STRUCTURAL M

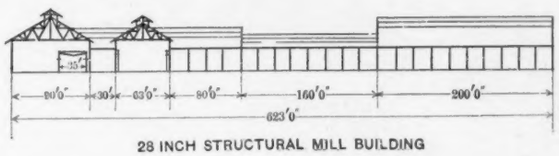




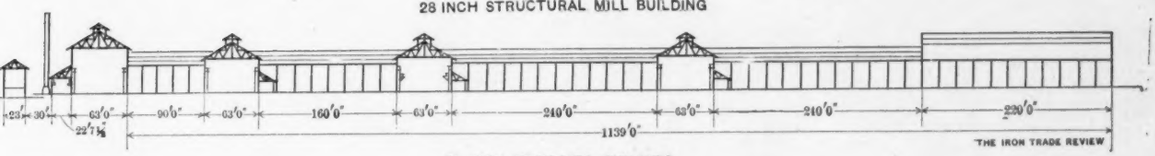
NCH STRUCTURAL MILL.



28 INCH RAIL MILL BUILDING

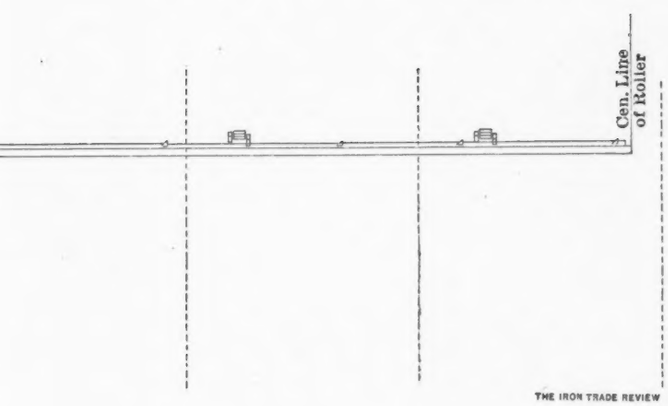


28 INCH STRUCTURAL MILL BUILDING



48 INCH GRAY MILL BUILDING

ELEVATIONS OF NEW BUILDINGS.



PLAN AND ELEVATION OF NEW MILLS IN SAUCON PLANT OF THE BETHLEHEM STEEL CO.

punches, riveters, multiple drills and facing machines for finishing beams and columns.

In construction the Grey mills are somewhat similar to a universal plate mill with separate sets of horizontal and vertical rolls. These sets of rolls form the web and flanges by combined rolling operations acting at right angles. Both web and flanges are produced in much the same manner as the rolling of universal mill plates. The Grey mills at Bethlehem are similar in construction to the Grey mill at Differdingen, except that the Bethlehem mills are larger and embody many improvements and modifications that have been suggested by the five years of operation of the Grey mill in Germany, which has been producing beams up to 30 inches in depth with flanges 12 inches wide.

In the ordinary beam mill the web is the only part of the shape which is formed by an actual rolling operation, the flanges being produced by crowding and dragging the metal through the flange groves where no rolling action is possible, owing to the construction of the rolls. In the production of a beam by the ordinary beam mill, the outer edges of the flanges are churned between the upper and lower rolls and the points of contact of the rolls with the shape are acting with a large difference in linear speed. In the case of a 24-inch beam with flanges 7 inches wide, rolled in a 28-inch standard beam mill, the middle roll at the point of contact with the outer edge of the beam flange is 21 inches in diameter, while the diameter of the upper or lower roll at the point of contact with the outer edge of the beam flange is 35 inches. As both rolls have the same angular velocity, their linear velocity at the points of contact with the outer edge of the beam flange are in proportion to their diameters at such points of contact, or in other words, one roll is moving with a speed of 1 2-3 times the velocity of the other roll. The effect of this becomes apparent especially in the larger sizes of beams rolled by the usual method, as they show a large variation in physical qualities of the material in the webs and flanges, which is due to this anomalous method of rolling. Such conditions produce large internal stresses in the shape caused by the unscientific deformation of the metal in the rolling process.

This consideration has prevented the economical design of beam sections and has limited the width of the flange practically within narrow limits, the result of which has been to confine the production of beams to shapes of relatively small size and to sections having an uneconomical distribution of metal viewed from the structural standpoint.

By means of the Grey method of rolling beams, the sections can be designed to give economical distribution of the metal. Larger beams can be rolled and the flanges can be made very much wider than it is possible to produce in the usual beam mill. The wide flange beams rolled by the Grey mill in Germany are extensively employed in construction in Europe, England, Canada and other foreign countries. The smaller sizes are used for column purposes and the deeper sections are used to take the place of riveted girders. The operation of the Grey mills at Bethlehem will make the advantages of such sections available to engineers and constructors for the first time in this country.

The Grey mill produces beams by the same method as is used in the rolling of universal mill plates with a

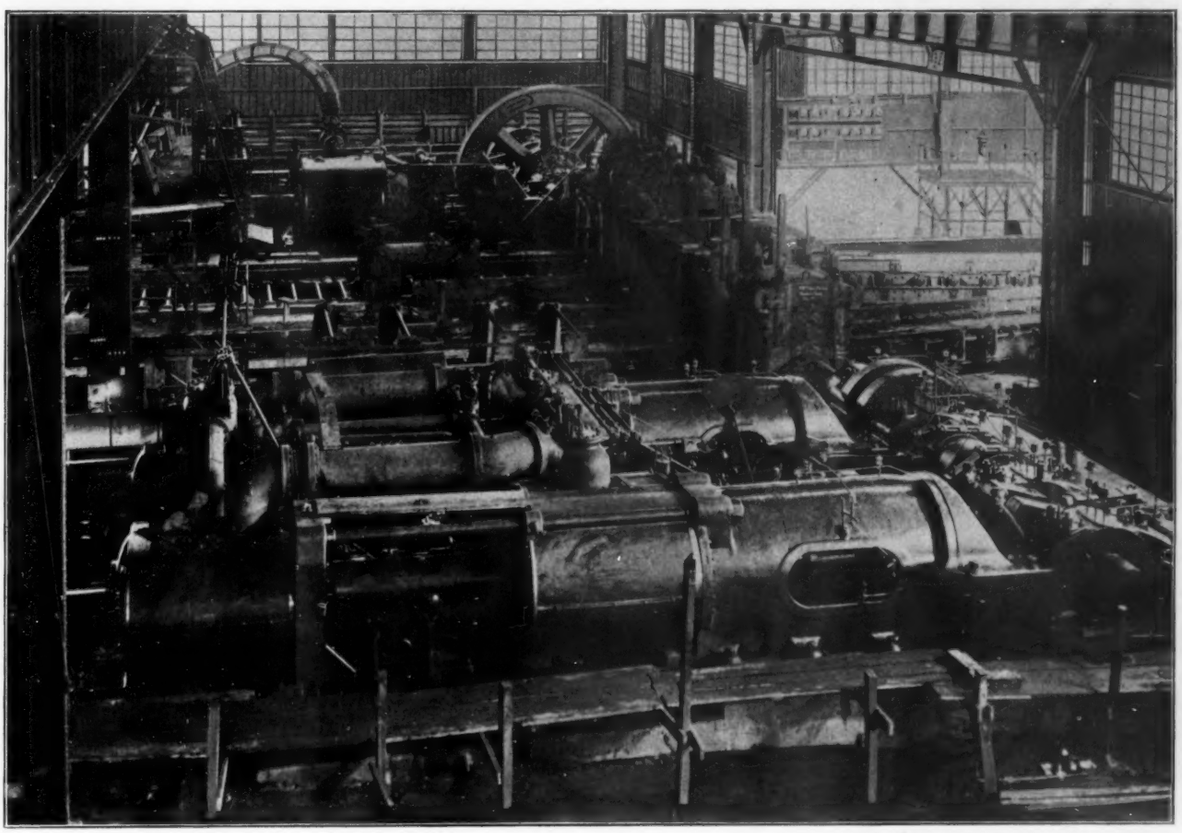


FIG. 11—ROLL MILL TRAIN AND ENGINES, SAUCON PLANT, BETHLEHEM STEEL CO.

practically uniform amount of reduction in the rolling for all parts of the shape. Beams of all sizes and shapes rolled by the Grey mill show great uniformity in quality of material throughout the section, thus indicating equal reduction work in the rolling process and the absence of internal stresses. Such sections are safer and more reliable than beams rolled in the old way, especially when they are to be used in places subject to impact and vibration. For the larger sizes of these sections, it is intended to use ingots up to ten tons in weight, so that the work of reduction in rolling the shapes will be sufficient to develop proper ductility of the metal.

At Differdingen, the beams are finished from the blooms by a single Grey mill, but at Bethlehem there will be two such mills, one to be used for roughing and one for finishing. This arrangement will obviously give an increased capacity to the mill, and the production is expected to be 1,000 tons of beam shapes per day.

The new structural shapes which will be rolled by these works are especially designed to fit the needs of structural practice in this country, and three separate types of shapes will be rolled. Special I-beam sections will be produced from 8 to 30 inches in depth. These beams up to 24 inches in depth correspond to the usual standard beams rolled by other mills in this country, but because of the better distribution of the metal in the section the weight of these special beams is 10 per cent less than that of standard beams of the same depth and strength. Consequently, such sections for equal strength effect an economy in weight of material employed and afford a corresponding advantage in cost for their use in construction, as compared with the shapes which have hitherto been rolled.

Girder beams with wide flanges from 8 to 30 inches in depth comprise another set of sections which are to be produced. These girder beams offer the same carrying capacity as usual standard beam sections, but for equal carrying capacity and for the same depth of section, these girder beams weigh from 12½ per cent to 15 per cent less than standard sections now in use. The largest size of girder beam it is intended to roll at present is a section 30 inches in depth with flanges 15 inches wide, weighing 200 pounds per foot. The weight of this section is 2½ times that of the largest standard beam rolled in this country up to the present time and it offers a carrying capacity of 3½ times greater. Such a section, therefore, affords an economy of 40 per cent in weight of material for equal carrying capacity, as compared with the largest beams which are in use. Large beams of this type will be used as girders for buildings, for crane runways, for bridges and for many other purposes, where otherwise riveted girders would be required, and will effect an economy in the weight of material, as well as a saving in the cost of fabrication, thus giving economy in both directions.

Wide flange beams, called H-column, will be rolled, especially for column purposes for buildings and for similar purposes. Seven sizes of these H-columns wil be provided, from 8 x 8 inches to 14 x 14 inches, inclusive. These sections are increased or diminished by the spreading of all the sets of rolls, an operation which the mill is designed to perform mechanically. By this method the 12 x 12-inch col-

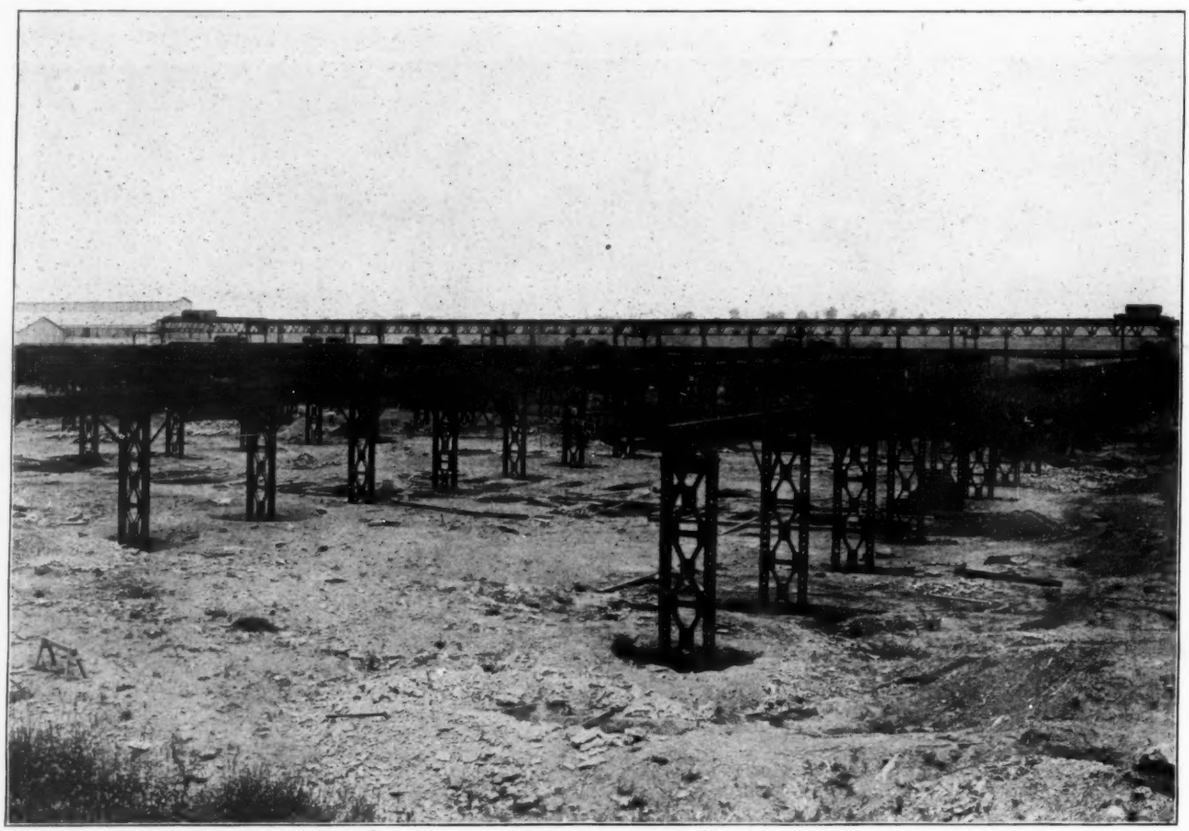


FIG. 12—SHIPPING AND STORAGE YARDS, SAUCON PLANT, BETHLEHEM STEEL CO.

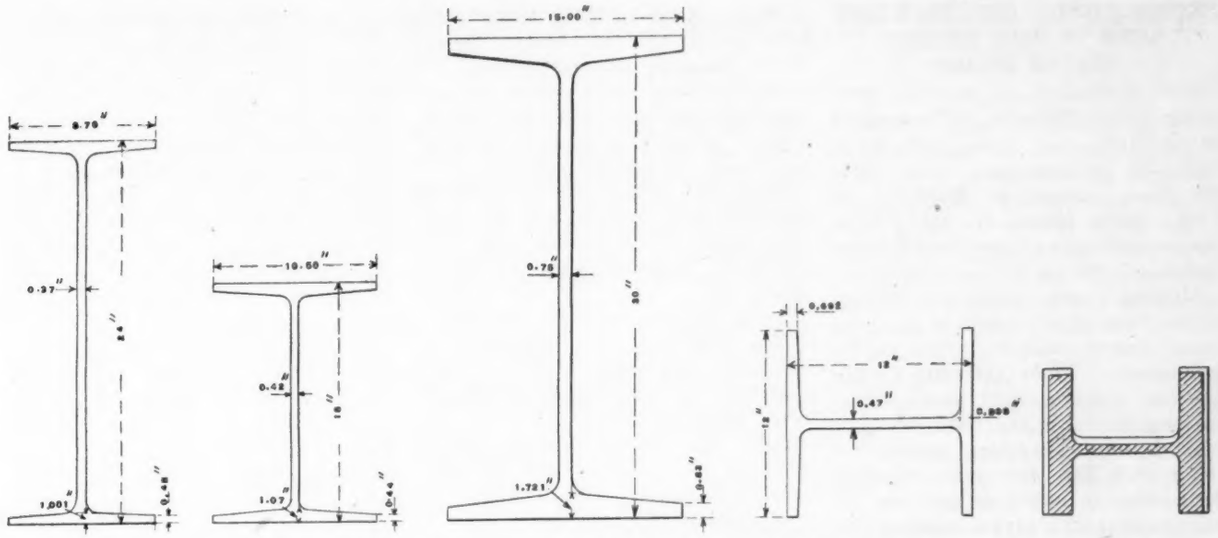


FIG. 13—SHAPES TO BE ROLLED IN GREY MILL OF BETHLEHEM STEEL CO.

umn section, for instance, can be varied furnishing a series of similar sections from a minimum area of 12 square inches, increasing by increments to an area of about 80 square inches, without requiring any changing of the main rolls. In this way, it is possible to roll all of the columns required for an ordinary 15-story building at the same rolling without change of rolls. This will afford a promptness of delivery from the mill, which it is impossible to obtain in the present system of column construction, where numerous sizes of sections are needed to cover the same range of strength. These sections have been employed by some architects in the design of buildings coming up in the near future for construction. The only fabrication required for finishing these rolled column sections is to provide for splices and connections, which is a relatively small amount of work to be done to fit the columns for use in a building. Such connections can easily be made by the usual methods of standard structural practice.

The company has prepared, and is now issuing a catalog giving complete information regarding the dimensions, weights and properties of all the structural shapes it will roll, such information being for distribution to engineers, architects and others engaged in construction.

The question of these new structural shapes has been considered by many of the leading engineers and architects in the country who regard the innovation as a radical improvement, and have strongly endorsed it as a distinct advance in the field of structural work. These shapes will offer great economy in the construction of steel work, and at the same time will permit of an improvement in the design of such work. They will extend the application of rolled steel shapes to construction in a wider field, will simplify the detail of such work and reduce the cost of fabrication.

Storage and Shipping Yards.

Particular attention is called to the storage and shipping yards at the delivery end of the mills. They contain every facility for the quick and economical handling of material from the 28-inch structural mill and the Grey universal beam mill. Roller tables from these mills deliver the material through and under all of the crane runways and eventually into a structural shop at the east end of the yard, where the Grey beam mill products may be fabricated. This storage and shipping yard is 750 feet x 800 feet and is equipped with nine parallel 84-foot storage crane runways with a transverse runway across each side, intersecting with the others. The tract upon which the yards are located contains 14 acres and is equipped with 13 cranes of the Pawling & Harnischfeger make completely covering the yards.

Power and Boiler Plant.

The power and boiler house immediately north of the open-hearth ingot mold storage contains 18 batteries of Stirling water tube boilers set in a double row with an elevated track between for handling the coal supply. The fuel is rice or slack anthracite. The boilers are equipped with fan blowers. The main pumping station of the plant is located on the bank of the Lehigh river, and contains one 12,000,000-gallon Snow high-duty pumping engine, three Buckeye centrifugal pumps and two 1,000 horsepower batteries of Stirling boilers. Two Alberger condensers have been installed, one on each side of the new mills, exhaust steam from the mill and power engines being about equally divided between them. The condensing system is operated by the centrifugal pumps at the river station and the return water will be utilized in return turbines which will assist the steam engines at the pumping station to operate the centrifugal pumps. A steel stand pipe with 500,000 gallons capacity has been erected on high ground between the two plants and connects with the water supply of each.

THIN CASTINGS.

A new method of making thin castings which cannot be cast in a mold in the ordinary way without chilling has recently been patented by George H. Brabrook, Taunton, Mass. The patent is based on the fact that phosphorus permits the metal to run very fluid, and when a thin section is to be cast the metal will not chill, but will fill the mold. The process is applicable to either sand or chill molds, and for such metals as bronze, etc., red phosphorus is used. For soft metals, yellow phosphorus is used. The mold is sprayed with an emulsion of red phosphorus and kerosene and the metal is poured in the usual manner. This process has been found particularly advantageous in the casting of ornamental work of all kinds.

PRODUCTION OF MOLDING SAND IN THE UNITED STATES IN 1906.

The production of molding sand in the United States in 1906 amounted to 3,371,103 net tons, valued at $2,063,151, as compared with 3,084,098 tons, valued at $2,102,423 in 1905. These figures are taken from the annual report of the United States Geological Survey.

Molding sand, says the report, varies from clayey loam to a clean, sharp, coarse sand, according to requirements. Three essential qualities in molding sand are refractoriness, porosity, and bond. In general, the finer and more intricate the design the finer the sand required. Its refractory nature is governed by the presence of a high content of silica and the absence of such fluxing constituents as lime carbonate, alkalies, and iron oxides. The material, including the bond, must possess at the same time plasticity and strength. It must be plastic in order to be molded around the pattern, and it must have sufficient strength to stand when unsupported by the pattern and to resist the impact of the metal when poured into the mold. Too much clay and iron oxide will cause the mold to shrink and crack under the intense heat, yet too little will cause it to dry and crumble, if not to collapse entirely. Under a simple preliminary examination a good sand should show to the unaided eye grains nearly uniform in size, angular rather than round, and when spread on dark paper it should show no dust. To the touch the sand should feel sharp rather than smooth, and when moistened with 10 to 20 per cent of water it must be capable of being formed into balls which will not become pulpy or be too easily crushed.

The following analyses show the average chemical composition and relative fineness of grain of standard molding sands used for various purposes:

Sand for delicate molding.—Silica, 81.50 per cent; alumina, 9.88 per cent; iron oxide, 3.14 per cent; lime, 1.04 per cent; magnesia, 0.65 per cent; grain, fine.

Sand for medium class molding.—Silica, 84.86 per cent; alumina, 7.03 per cent; iron oxide, 2.18 per cent; lime, 0.62 per cent; magnesia, 0.98 per cent; grain, medium.

Sand for heavy castings.—Silica, 82.92 per cent; alumina, 8.21 per cent; iron oxide, 2.90 per cent; lime, 0.62 per cent; magnesia, 0; grain, coarse.

The Westinghouse Electric & Mfg. Co., in its report of operations for the six months ending Sept. 30, states that its manufacturing profit during the period in question aggregated $2,823,316, its miscellaneous income $1,187,398 and its total income $4,010,714. For interest on bonds, debenture certificates and miscellaneous accounts with depreciation charges, $2,067,920 is involved, leaving a surplus for the six months of $1,942,794.

The Chicago Pneumatic Tool Co., in the report issued covering its nine months' operations up to Sept. 30, 1906, shows total profits of $727,284, and net profits of $579,576 in the period. After charging off interest, sinking fund reserve and dividends, a surplus of $264,759 is shown, making the total surplus at present $1,143,168.

STEEL WELDING.

From *Engineering.*

In a treatise written by Prof. S. Ragno, inspecting engineer for the Italian State Railways, and edited by Ulrico Hoepli, Milan, we find the table of which the following is a translation. The test pieces were taken from two qualities of Siemens-Martin steel; one was machined as taken from the plate, and six were welded and otherwise treated previous to machining.

The length of the test piece was equal to $8\sqrt{s}$ s being the section. The weld was in the middle of the piece. The 0 in the table indicates that the piece either broke previous to being tested, or withstood practically no stress in the testing machine. The figures speak for themselves. Among other information, Prof. Ragno gives the following: A firm which has made a specialty of stamped work was given an opportunity of testing welds made by the oxy-acetylene blow-pipe on 5-millimeter (0.19 inch) thick Siemens-Martin mild and nickel steel sheets. The tests were as follows: Mild steel, which showed on ordinary samples 20.95 to 29.84 tons per square inch and 30 per cent elongation, showed with a welded sample 19.68 to 22.86 tons and an elongation of 7 to 3 per cent; the nickel-steel samples, which gave 42.54 tons breaking strain and an elongation of 17 per cent, only gave with welded sample 21.50 tons and 3 per cent elongation.

Thickness.	12 mm. (0.47 inch).		6 mm. (0.23 inch).		12 mm. (0.47 inch).		6 mm. (0.23 inch).	
	Breaking Strain Tons per Sq. in.	Elongation Per ct.	Breaking Strain Tons per Sq. in.	Elongation Per ct.	Breaking Strain Tons per Sq. in.	Elongation Per ct.	Breaking Strain Tons per Sq. in.	Elongation Per ct.
Non-welded test piece	28.0	24.0	27.30	22.0	42.54	15.0	44.44	13.0
Electrically welded—								
Welded test piece	11.49	0	19.68	6.0	7.14	0	17.27	4.0
Welded test piece	16.19	0	16.82	4.0	11.56	0	16.70	2.0
Welded and annealed test piece	10.03	0	8.13	0	2.54	0	14.86	0
Welded and annealed test piece	9.65	0	16.25	0	13.33	0	7.81	0
Welded, tempered and annealed test piece	18.6	0	17.21	2.0	6.98	0	0	0
Welded, tempered and annealed test piece	14.92	0	0	9.0	0	0	0	0
Non-welded test piece	27.62	27.0	30.48	20.7	39.68	8.0	41.27	7.1
Welded by oxy-acetylene blow-pipe—								
Welded test piece	22.22	6.4	23.81	11.6	20.13	1.3	17.65	2.0
Welded test piece	17.27	2.6	26.54	7.1	0	0	16.51	1.8
Welded and annealed test piece	24.44	8.9	0	0	10.73	1.3	18.73	4.0
Welded and annealed test piece	24.76	7.7	25.40	14.2	0	0	17.14	4.4
Welded, tempered and annealed test piece	19.75	3.9	26.09	8.9	15.36	0	24.13	0
Welded, tempered and annealed test piece	18.48	2.6	26.03	5.7	0	0	0	0
Non-welded test piece	27.62	27.0	30.54	20.0	41.9	16.5	44.44	11.8
Welded by oxy-hydrogen blow-pipe—								
Welded test piece	0	0	14.41	2.8	0	0	11.3	1.0
Welded test piece	0	0	13.33	4.7	0	0	0	0
Welded and annealed test piece	0	0	13.97	3.0	0	0	10.16	1.8
Welded and annealed test piece	0	0	18.41	4.4	0	0	8.25	0
Welded, tempered and annealed test piece	0	0	17.14	3.0	0	0	15.36	0
Welded, tempered and annealed test piece	0	0	0	0	0	0	9.52	0

E. W. Wilson has resigned as manager of the Wilson Saw Co., Port Huron, Mich., and has been succeeded by F. D. Keene, of Chicago.

THE MACHINE SHOP; ITS PLACE IN THE PLANT[1]

BY OSCAR E. PERRIGO

Like all other conditions for which we have to plan, there are certain more or less well defined requirements which must be taken into consideration in deciding the location of the machine shop and its relations with the other component parts of the plant.

The two principal requirements in the location of the machine shop are: Convenience of getting its raw material in and getting its finished product out; and the receiving its raw material and rough stock, whether from the outside world, from the foundry, or the forge shop, as directly, certainly and economically as possible; and being able to ship or put in store its finished product as soon as it is completed, and with as little handling as possible. For these reasons, the entire plant should be located near a railway, or if this is not possible, it should be near the shore of navigable water; and sometimes it is possible to have the advantages of both these transportation systems. The arrangement and grouping of the buildings will be, to a certain extent, governed by these conditions.

As the transportation of stock and material to and from various points within the plant is a matter of much importance, both as to its promptness and its economy, the buildings should be so grouped as to conduce to these results, attention being given to so arranging the different buildings, and departments within the buildings, that the raw material may pass directly along from the point of its reception from outside the plant to its condition as completed product, and its shipment out of the establishment. This is a matter much better understood and appreciated than it was a few years ago and the result is seen in the more careful planning and arranging the buildings composing the plant.

While these requirements take into account the question of distance from one building to another, this condition is not all that is necessary to be considered. It is well to remember the kind of transportation facilities available. Two buildings placed 50 feet apart and provided with ordinary hand trucks will be, relatively, so far as expense of transportation is concerned, farther apart than if the distance is 300 feet and a smooth, narrow gage track is laid and provided with cars properly built for handling the material.

Hence, the question of transportation must be carefully looked after and planned at the same time that the location of the buildings is being considered, and this is particularly the case with the machine shop, not only in its relation to the other buildings of the plant, but in arranging the departments within itself with the same end in view.

In laying out the plans and determining the location of the several buildings composing a manufacturing plant, whose product is to be some kind of machines or machinery, large or small, it is usual to begin with the machine shop, this term being understood to cover the building or buildings containing iron working machinery, and now frequently designated a factory. After the location and general dimensions of the machine shop have been determined, it is customary to group the other buildings around or near it, according to their uses and purposes and with reference to transportation facilities and convenience of operation and administration.

This rule, has, however, many exceptions to which it will be well to call attention in order to show that it sometimes happens that the machine shop must defer to some of the other divisions or departments in the matter of location; for instance, the location of a railroad with reference to the plot of ground available for the erection of the buildings, and the necessity of bringing in a side track at or near a certain point.

The form and extent of the plot of ground may be such that a regular or even a desirable plan cannot be well laid out. This is the case in the plant shown in Fig. 1, which was originally a comparatively small plant, consisting of about one-half of the front portion of the machine shop in length, and of only two floors, and about one-fourth of the present length of the foundry space. The street at this point is over a bridge, on a level with the second floor of the machine shop and spanning the railroad tracks and canal. The soil on the canal bank is alluvial and as there is no re-

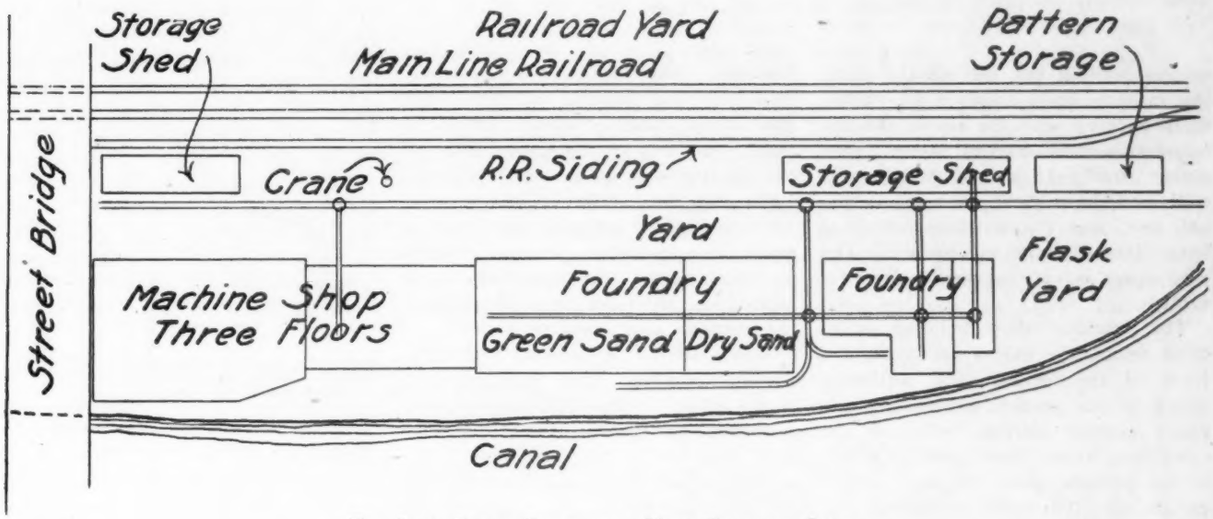


FIG. 1—A PLANT BUILT IN A VERY CONFINED SPACE.

[1]Second of a series of articles on shop management and cost keeping.

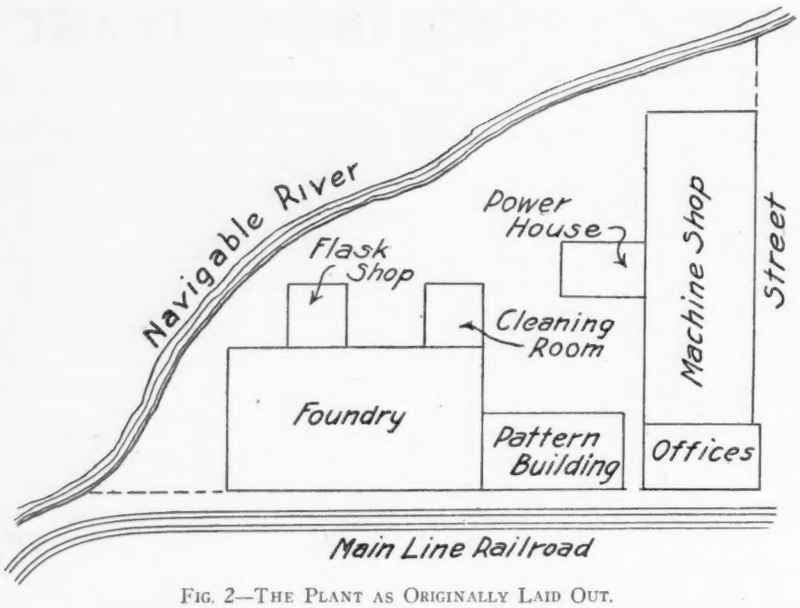


FIG. 2—THE PLANT AS ORIGINALLY LAID OUT.

taining wall at the side of the canal the machine shop building was gradually slipping into the canal, the old foundation wall having moved altogether nearly 18 inches, and a new wall had been built outside of the old one, and the building wall has been "jacked" back and upon it. The yard space is very narrow and inconvenient.

The machine shop building is of three floors, the offices occupying the front of the second floor, adjoining which is one portion of the drafting room, another portion being on the third floor at the front, next to which is the pattern shop. Beyond this a certain lot of patterns are stored. Another lot is stored in a room built just under the roof of the green sand foundry. Still another lot is stored in a one-story building erected under the bridge, and a fourth lot in a small building at the lower end of the yard and shown in the engraving.

On the third floor of the narrow addition to the machine shop was a small iron foundry, devoted mostly to bench work, the materials being carried up to it on an elevator, and the castings sent down in a chute.

Many similar expedients throughout the buildings have been adopted in the effort to overcome the cramped condition of the plant due to the fact that it has no opportunity to expand in any direction, its collection of buildings being the result of a growth rather than any definite plan or system of extension.

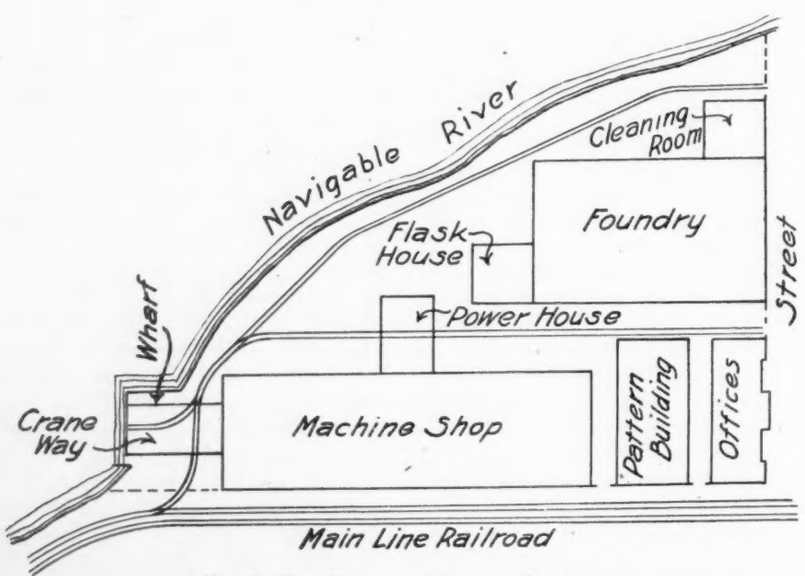


FIG. 3—THE PLANT AS FINALLY ARRANGED

The condition of the soil may be such that upon the portion of the ground where we desire to locate the machine shop, the expense of proper foundations would be prohibitive.

A body of water and its influence on certain parts of the ground may interfere with locating the machine shop in a desirable position. In such a case the plan must be revised. A case in point is that shown in Fig. 2, which gives the original plan for the location of the buildings. It was found, however, that the ground at the end of the foundry was too wet to be suitable for locating a foundry floor unless the entire surface was cemented, and that the expense of properly preparing it would be very high. The plant was therefore rearranged as shown in Fig. 3, placing the machine shop at this corner of the site, resting it on stone and cement work built at a considerable less expense than would have been the case for a foundry floor, and also gaining some advantages in the location of railroad tracks, a crane-

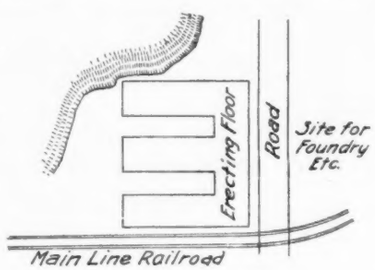


FIG. 4—PROPOSED LOCATION.

way and wharf facilities, permitting of easy and convenient shipping by rail or boat. A similar wharf might be built at which material and supplies could be discharged near the foundry, but the present track facilities appear to be sufficient. The general arrangement of the buildings were considerably improved by the circumstances that made the revision of the lay-out a necessity.

The presence of large masses of fixed rock on one portion of the site may modify the plans in locating the machine shop or in the design of it. Fig. 4 shows a case in point. It was desired to locate the machine shop as indicated, but a large mass of rock rising 40 to 50 feet in height stood in the way. It was estimated that it would cost $5,000 to remove this rock, and as there was already an abundance of comparatively loose rock for foundations, this would be an expense with little in the way of reimbursement. It was then suggested that the plan be so changed that the building would be quite close

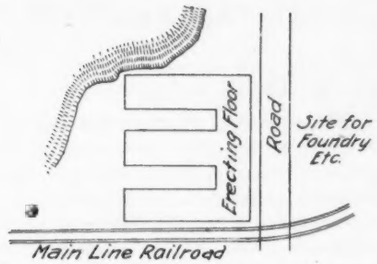


FIG. 5—PLANT MOVED TO AVOID OBSTRUCTION.

to the main line of railroad tracks, as shown in Fig. 5. This change would, however, defeat the plan of a line of track through the erecting shop, which was wanted. As all three machine shop wings were not immediately needed, the original location was adhered to and but two wings built, as shown in Fig. 6. In due time the rock contained in the obstruction was sold for a neat sum, the purchaser agreeing to remove it himself and to leave the ground comparatively level. This cleared the way for the completion of the building as originally intended, and gave the required room for the railroad tracks desired.

The different grades of different parts of the site are sometimes troublesome, and usually more so as to the location of the machine shop than to any other building, unless it is the foundry. However, by proper planning these apparent disadvantages may be turned to good use and often prove rather an advantage than otherwise. A case of this character is that of the plant shown in Fig. 7. The railroad facilities of the proposed plant were excellent and there was ample room for such private track facilities as were desirable. There was considerable difference in the grade of different parts of the site. It was realized, however, that it would be a comparatively easy task to reduce the inequalities of grade to two levels, one approximately 20 feet higher than the other. With this matter decided, the arrangement of the buildings was a much easier problem. The grades were arranged substantially as shown in profile at the right in Fig. 7. A convenient road was built through near the center of the site and on the higher level. The machine shop buildings and those more nearly associated with them were assigned to the higher level, and the foundry and its quota of buildings were to be placed on the lower level. The reason for this disposition and the advantages gained by it are these: A large bulk of the material and supplies coming to the plant usually go to the foundry, while the foundry product goes to the machine shop. At the same time

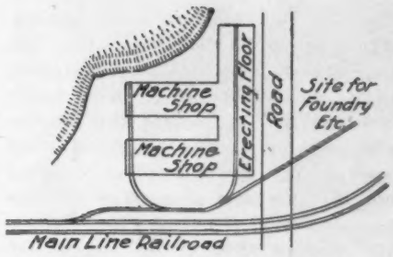


FIG. 6—THE FINAL PLAN.

the product of the machine shop is shipped out of the plant. Therefore, a large proportion of this work at the machine shop will be loading, while much of that at the foundry will be unloading. This being the case, it is very convenient to have the incoming track to the foundry on the higher level, while the foundry building is on the lower level. The other tracks serving the foundry are on the level of the foundry floor and connect with those of the higher level some distance away.

The location of the machine shops and the grouping of them with the other buildings near them is an ideal arrangement. The manufacturing bays or wings being located with ends joining the side of the erecting shop permits the traveling cranes in the former to bring their loads directly to the higher crane in the latter department and so cover the entire

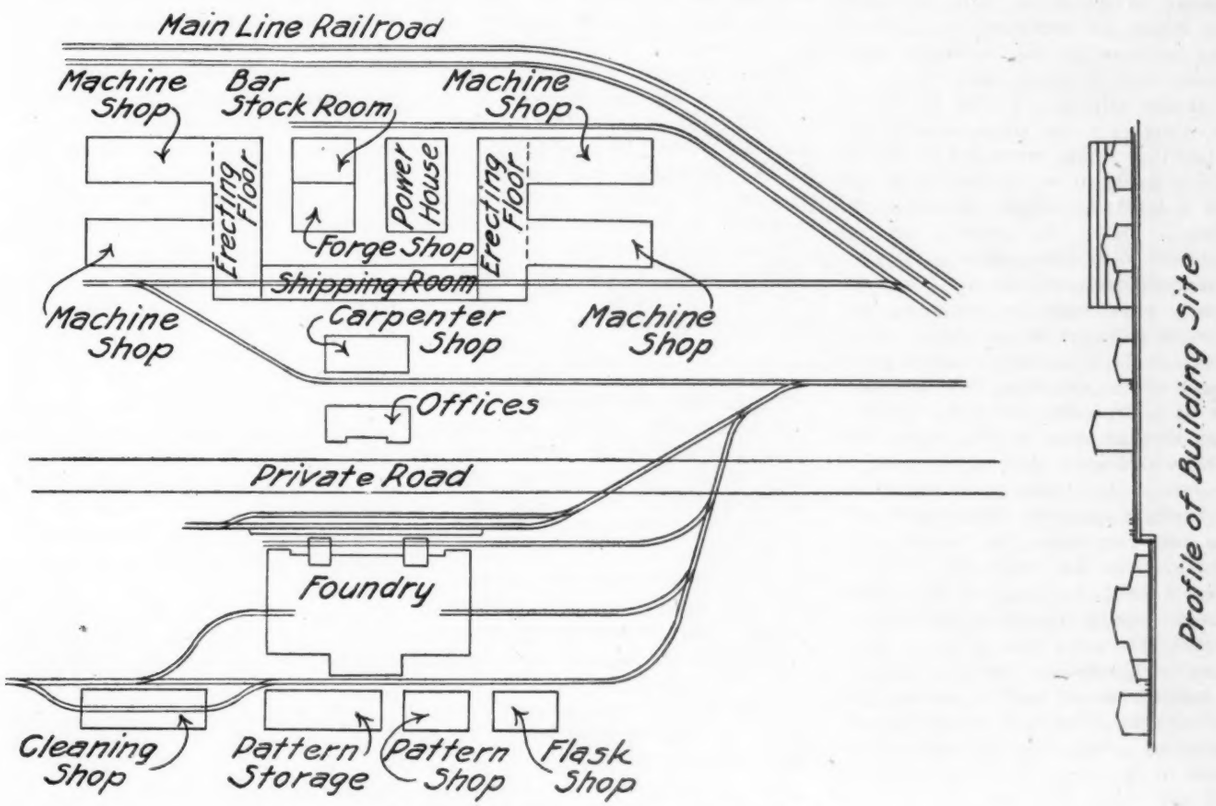


FIG. 7—THE PLANT ARRANGED ON TWO LEVELS.

floor by the combined crane service. The erecting buildings extend to and over the shipping tracks at either end of the shipping building, giving excellent facilities for loading the machinery upon cars. The additional track passing between the office building and the carpenter shop offers the opportunity to send out cars loaded from the machine shop at the left of the plant without disturbing those which are being loaded at the machine shop at the opposite end.

The space between the two groups of machine shops affords an ample and centrally located space in which to erect the power house, forge shop, cutting-off room, bar stock storage and similar departments, bringing them within convenient reach of the railroad track on the one side and by yard and shop tracks to the different departments of the machine shop on the other.

The question of future extensions of the plant buildings has been well considered. Any one or more of the machine shop wings may be extended outwardly from the center as desired. The erecting floors are ample for a considerable increase in the manufacturing departments, but still if this space need to be increased, these buildings may be extended toward the rear.

The foundry building might be extended in either or both directions as might be necessary to facilitate the increase of the particular work being done in either end.

If any criticisms are to be offered in reference to the arrangement of the plant they would surely not be such as would apply to the machine shop and its related buildings. Possibly the distance from the foundry to the machine shop group might have been decreased with advantage. There are many advantages in arranging the various buildings in a compact group, one of which is that workmen going from one to the other lose less time in doing so. The writer has made a considerable study of this feature and observed a great deal of lost time in this way that should have been saved.

Recapitulating the foregoing it will be seen that while the machine shop continues to be really the important and central building of the plant, around which the more subordinate buildings cluster according to their uses and purposes, there are various conditions which tend to modify their relative locations with respect to the plant in general, the location and extent of the site and the requirements of the other buildings arising from their particular necessities and uses.

All these will be again modified more or less by the kind of machinery or output to be produced. In some cases this will be such as to magnify the importance and dimensions of the iron foundry; again to double the relative area of the machine shop, or to make it advisable to construct it of two or more floors, instead of one, or one floor with side galleries. In either case there may be an unusual quantity of bar stock of various kinds used, making the cutting-off room proportionately large. Or a large number of hammered or dropped forgings are needed, vastly increasing the importance of the forge department.

Our first duty, then, in a preliminary study of the requirements of a manufacturing plant, particularly as relates to the machine shop, will be to thoroughly study and carefully consider all phases of the kind and quality of the proposed product, and of the methods of its handling and working through the different processes, from the raw material to the finished product. In this work we must be guided by mechanical engineering knowledge and practical experience in solving manufacturing problems, consequently the architect will not be able to give us much assistance, even though his specialty may be the design and erection of manufacturing buildings.

British Iron Ore Output.—The annual home office returns, just issued, show that the output of iron ore in Great Britain during 1906 was 15,500,406 tons, valued at £4,085,428, as compared with 14,590,703 tons, valued at £3,482,184 in 1905. These figures show increases of 909,703 tons in volume and £603,244 in value. The ore yielded 5,040,360 tons of pig iron, as against 4,760,187 tons in the previous year. Including imports, the total quantity of iron ore available for furnaces in the United Kingdom in 1906, exclusive of mill and forge cinders, was 23,874,271 tons, as compared with 22,433,369 tons in 1905.

STEEL TIES IN GERMANY.

By Dr. N. C. A. Haarmann.

In the volume of the *Organ Fur Die Fortschritte des Eisenbahnwesens* of the present year, on p. 190, an article on "The Behavior of Steel Crossties" gave a brief report, taken from the *Railroad Gazette* of March 1, 1907, of the derailment of the 18-hour train of the Pennsylvania railroad on Feb. 22 at Mineral Point, Pa., on an experimental section of track laid with steel ties. The report concludes with the statement that the committee which investigated the accident was unable to determine with certainty the cause of the derailment, but judged that at the point at which the derailment began a stone or other object had become wedged between the flange of one of the wheels and the rail, thus producing a heavy lateral stress, which was sufficient to shear the bolts holding down the outer side of the outside rail, the cold weather prevailing rendering ties and fastenings rigid. The committee being of the opinion that, if the ties had been of wood, the resulting damage would have been less severe, it was decided to remove the 3,000 steel ties laid in that part of the track and to replace them with wooden ties.

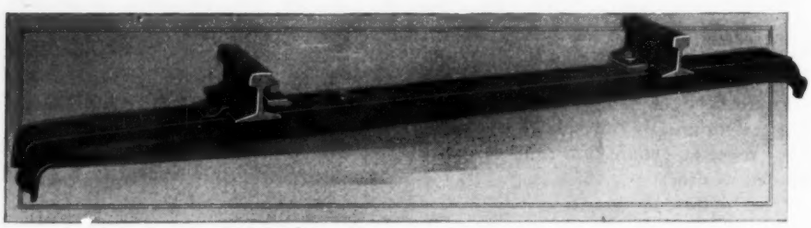


Fig. 1—Haarmann Steel Tie.

While it is impossible for the writer without having made an examination of the track and local circumstances to offer a definite opinion as to the cause of the accident, still, in view of a long and extensive experience in connection with steel cross ties, some information is presented on the subject which may possibly be of interest.

We, in Europe, have suffered many disappointments in the early use of steel cross ties. It is not as easy as it seems to determine the correct shapes and proportions for steel ties and their fastenings. A railroad track equipped with them should be better and have a longer life than one built with wooden ties. It was a difficult task to overcome the obstacles by means of experiments and from the results of operation and to deter-

mine those conditions which a steel tie track must fulfill. Among these are:

1. Sufficient supporting area in contact with the ballast in order that the pressure on the ballast may not be excessive.

2. Sufficient moment of inertia in a certain length, in order that the pressure may be equally distributed.

3. Protection of the upper surface of the tie against friction and stresses, in order to prevent bending and rupture.

4. Large surfaces of contact at fastenings, to prevent rapid wear.

5. Relief of the points of attachment from secondary strains, as the relief of bolts from side pressure or shearing strains, in order that they may safely fulfill the purpose for which they were designed.

The exhibit of our Track museum in the Transportation building at the Columbian Exposition at Chicago in 1893 was strongly approved by American engineers. Even at that time the increasing difficulty of obtaining wooden ties, on account of the rapid decimation of the forests in the United States, was causing discussion of the question how the wooden tie might be replaced. Mr. Fernow of the U. S. Forestry department had begun a careful study of all the experiments with steel cross-ties that had been made up to that time in different countries.

The samples of many different forms of steel cross-ties taken from tracks where they had undergone actual service exhibited in our Track museum were viewed with considerable interest by American railroad engineers. From the experiments that have been made in recent years by different American railroads, it is evident that in the course of the last 14 years the introduction of some substitute for wooden ties has, in some sections, become a necessity.

I can easily understand that your engineers should undertake the soluton of this difficult and economically important problem with a certain independence. As already mentioned, we have in Europe, in the course of many years of development, experienced many failures, the reports of which have undoubtedly reached you. Therefore, the endeavor to do better is an incentive to the American engineer. Nevertheless, I cannot imagine that you will be any more exempt from disappointments and failures than we, when, on the first introduction of steel ties, without experience and without precedents for guidance, we were compelled to advance with boldness and self-reliance. But now we have served our apprenticeship, after years of experimenting and improving. Whoever in Germany desires to use steel ties can obtain standard samples of constructions that have been proved in practice. This is convincingly shown by the fact that the employment of steel ties in German railroads has increased from year to year, although during their development defects were constantly being manifested and had to be overcome. According to official statistics, there were laid:

Year.	Steel ties.
1900	21,490,000
1901	22,272,000
1902	23,066,000
1903	23,908,000
1904	25,227,000
1905	26,576,000

The statistics for 1906 and 1907 have not yet been published, but the consumption has again increased. The so-called "hook plate" has been adopted for many years by the Prussian state railroad as the standard attachment for metal tie superstructure.

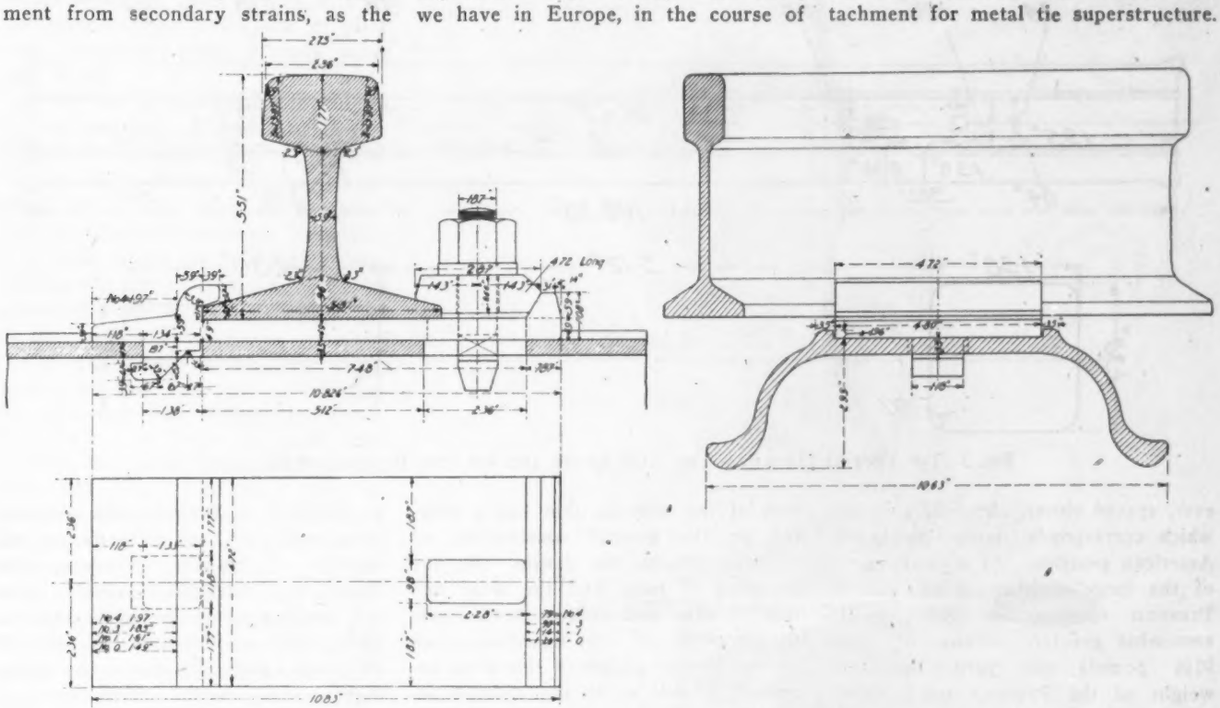


FIG. 2—CROSS SECTION OF HAARMANN STEEL TIE, TOGETHER WITH PLAN AND SECTION

Therefore, when I state that from 1882 to the end of 1905 58,000,000 of these hook plates have been used in connection with 15,000 miles of track, it is evident that we in Germany are beyond the experimental state, though, to be sure, it is impossible to end learning, and one must always be prepared to introduce improvements.

In view of these facts, it will be interesting for American engineers to familiarize themselves with our newest construction of steel tie, as shown by the accompanying drawings of the tie we are at present furnishing the Oldenburg state railroads and which is to be used on a section 25 miles long. The ties are 8 feet 10 inches long, 10⅝ inches wide and are spaced 30 inches center to center and weigh about 195 pounds.

The new features of these ties are two ribs or strips on the upper surface, between which the supporting plates are firmly held. The Wurtenberg state railroads have also built a section of road with these so-called "rib ties," as have also the Prussian state railroads on the Elberfeld-Breslau division. The advantages of these two ribs are so great that the Prussion railroad administration has adopted them for use on its ties, retaining, however, the width of 9⅛ inches for intermediate ties, while ties under the joints are to be 19 inches wide. The Prussian rib ties are, however, spaced closer, about 22⅛ inches, which corresponds more nearly to American practice. As a consequence of the large number of ties in the Prussian spacing, and also to the somewhat greater weight of rails, 91½ pounds per yard, the total weight of the Prussian track superstructure per yard of track is 453 to 463 pounds, while that of the Oldenburg track, with rails of 86 pounds per yard, is 411 pounds. The fastening of the rail to the tie is practically the same. Between the flange of the rail and the top of the tie is placed the so-called hook plate or hook studplate mentioned above. These hook plates protect the upper surface of the tie against stresses and friction, render superfluous a special fastening on the outside of the rail by means of screw bolts and relieve the clamplate screws on the inside of the rail of all lateral stress.

I should imagine that a similar construction would be suitable for American conditions, with the possible change of substituting plates of uniform thickness, thus furnishing a horizontal supporting surface to suit the vertical position of the rail customary in America.

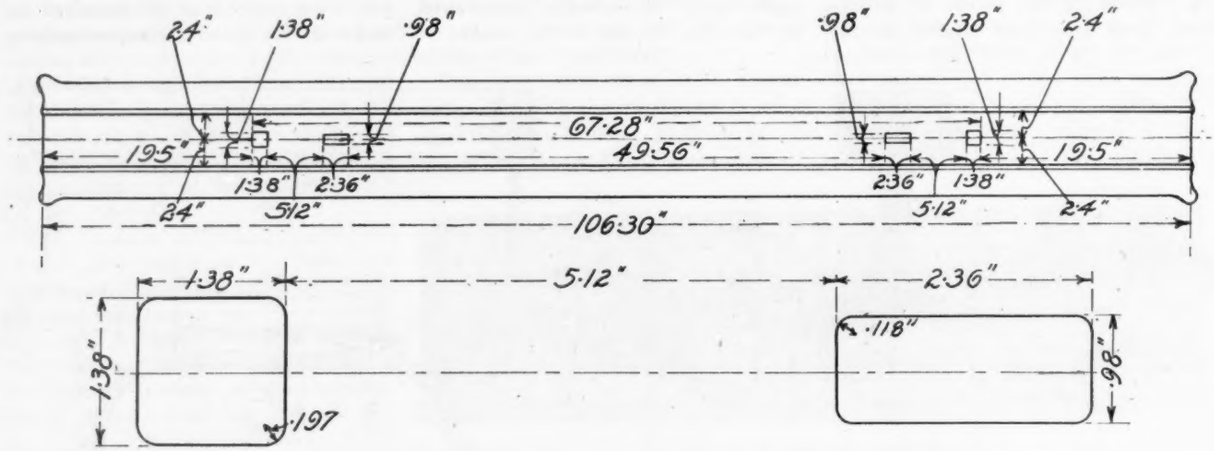


FIG. 3—TOP VIEW OF HAARMAN TIE; ALSO SHAPE AND RELATIVE POSITION OF HOLES IN TIE.

STEEL RAILS AND TRACK CONSTRUCTION.

Editor IRON TRADE REVIEW:

The proceedings of the American Society for Testing Materials, as published in THE IRON TRADE REVIEW of June 27 and the paper of President Dudley in the REVIEW of July 4 interested me very much, and I have watched for comments from the public press.

I have no practical experience in the manufacture of steel and therefore cannot question the opinions of any of these eminent gentlemen. But the incidental admissions made by members of the meeting, that had a bearing on the general construction of railroad tracks, the causes of the breaking of rails, and the wear and tear of rails and rolling stock, seem to me to be of vital importance and interest to the people of this great republic as well as to the railroad interests.

One gentleman said: "We do find poor tracks, poor rail joints, and they must be considered in deciding on the rail for the future."

This open challenge to consider all the points in the construction of railroad tracks that lead to the breaking of rails was passed over, in favor of the questions of cost of heavier rails and the process of their manufacture, as if the rails were the only important factor in track construction. Mr. Dudley did allude to "saving destructive work to the cross ties and road bed." He did set forth that "the former 20,000-pound capacity freight cars have been replaced by those of 60,000, 80,000 and 100,000-pound capacity, and locomotives of 107,000 pounds weight increased to 200,000 pounds in 1907." But what weight of metal should be put into rails and what foundation supports they would require to carry those enormously increased weights under the speed now demanded, seemed to stagger their comprehension. A paper on the "Effect of Moisture on the Strength and Stiffness of Wood" was presented, but not read. One gentleman contended that "90 per cent of the breakage of rails is in the head." Another member asserted that "the splice bars caused the breakage at the end." "Breakages do not occur at the rail ends," declared another member, "but at distances ranging from 4, 8, 10 and 12 feet from the ends." The New York Railway Commission reported the number of broken rails removed from tracks of that state during the months of January, February and March for three-year periods when rail breakages are heaviest were in 1905, 1,331, in 1906 was 826, and in 1907 was 1,244. To discuss or digest these points would trespass upon your columns.

The advocates of better foundations of steel cross ties for standard and street car lines and supports at rail joints—that would maintain a level line of rails and a continuity of strength at those points—answer the universal objection "They cost too much," by quoting the authority of the Carnegie company. They place the cost of steel ties complete to last 25 to 30 years—2,400 ties per mile, in track, less value of scrap, at $5,200. First class wood ties in track $1 each, five changes per 30 years cost $5, tie plates with spikes, 35 cents—total $5.35—cost per mile $12,840; add cost of burning and disposing of worn out ties $360; total, $13,200 as net cost per mile for 30 years. No account for hauling out 500 ties annually and the annual damage because of breaking up of road bed. At the above figures a railroad would have to the

credit of its tie account at the end of thirty years of $7,980 per mile. They could double the cost and the weight of the ties and have a balance of $2,760 per mile. The advocates of steel ties insist that the first important thing for a track is a good foundation, as is universally acted upon in every other superstructure, that wood and ties and spikes never did make, and cannot be made to make, a safe track. And with the enormous increase in the demand for railroad facilities and the great increase of loads and weights of rolling stock, and increased speed the foundations of safety must not be tampered with by the pretended necessary use of pitch pine, tamarack, cedar or any other soft wood.

If the corrosion theory propounded at this meeting and endorsed by the United States department of agriculture proves to be "the correct one beyond the peradventure of a doubt" and Mr. Dudley's assertion "providing as it does means for ultimately preventing the corrosion of iron and steel products" there is no limit to the life of steel ties.

The writer has patents and claims pending for a steel tie which gives a better, safer and more economical practice than has even been produced with wooden ties and spikes, fish plates, bolts and nuts. This is a steel tie with any width of base, with upturned flanges in the center which are cut to embrace the flanges and webs of the rails, in order to hold them perfectly upright and to gage. At the sides and ends the flanges are turned down to embrace enough of the ballast to hold the track in line. The upturned and downturned flanges in the base give it the required stiffness and strength to hold the lines of rails to an exact level. A strengthening bar under the rail joint has upturned flanges which engage both sides of the flanges of the rail which can move between these flanges on the tie plate to meet climatic changes. This strengthening bar extends between two ties and has a weight of metal under the joint to secure continuity of the lines of rails.

The public and the railroads are greatly interested in the adoption of the best possible devices for the safety of the lives of men and their property by the improvement of railroad tracks. The great number of patents granted is evidence of this interest, the best of which, whoever may present them, can be none too good for all the great interests involved.

J. M. GRISWOLD.

Detroit, Oct. 26, 1907.

A NEW LABORATORY ELECTRIC FURNACE AND PYROMETER OUTFIT.

The new patented quartz-lined electric furnace designed by Prof. Wm. H. Bristol has now been developed into a suitable form for use with the Wm. H. Bristol recording electric pyrometer, described in THE IRON TRADE REVIEW, Nov. 8, 1906, in such a way that the temperature inside the furnace may not only be controlled, but also automatically recorded on a chart. A special laboratory unit consisting of this electric furnace and recording pyrometer with attachments, designed for obtaining the recalescent points of steel and for hardening small tools, is shown in Fig. 2, with the various parts all mounted on the same standard in such compact form that the complete unit may even be conveniently used on an office desk, the electric current being supplied from an ordinary lighting circuit.

The electric furnace itself is of simple construction, its special patented feature being the lining of fused quartz which makes it possible to turn on the full current suddenly and thus to heat up the furnace quickly without danger of cracking its interior. Even when the furnace is heated to a bright red, a cold piece of steel may be introduced without injury to the quartz lining which at the same time serves as a perfect insulation between the metal and the heating coils. The accompanying illustration, Fig. 1, shows a form of this furnace which has been designed for tempering small tools and for heating soldering irons. A rheostat may be used to regulate the temperature, but for some applications this is dispensed with as for instance in the use of the furnace as a soldering iron heater with direct lamp plug connection. In that case, the winding of the heating coil is so arranged that the maximum temperature of the furnace will be correct for continuous service and not so high as to oxidize the soldering iron. For many other applications as for hardening tools and for laboratory work both a rheostat and a pyrometer are used with the furnace to great advantage.

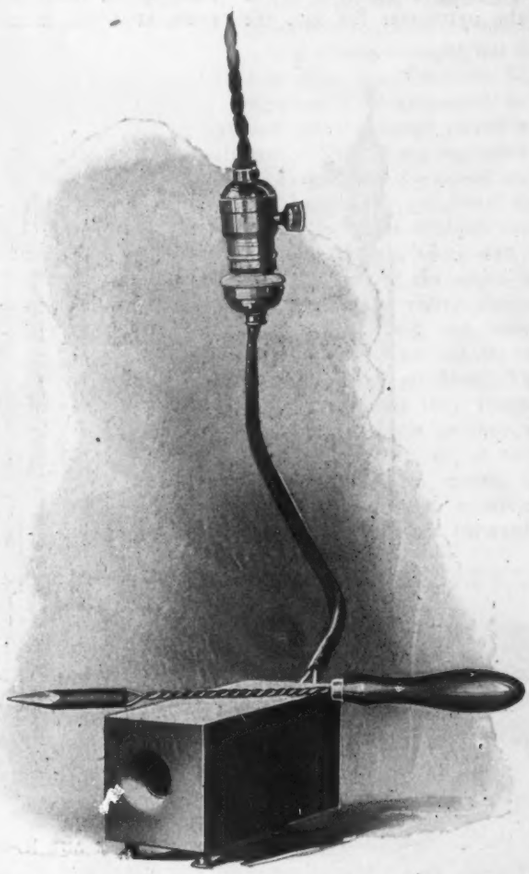


FIG. 1—PATENTED QUARTZ LINED ELECTRIC FURNACE FOR HARDENING SMALL TOOLS.

Fig. 2 shows the new laboratory unit especially designed for determining the recalescent points of various

kinds of steel. The electric furnace is here shown in circuit with a rheostat, so that after the full lighting current has been turned on, bringing the furnace up to a bright red heat on the inside almost immediately, the rheostat may be adjusted so as to maintain the desired temperature.

This illustration also shows the complete recording pyrometer mounted on the same standard and consisting of a platinum platinum-rhodium thermo-couple and a recorder The couple of the pyrometer fits into the furnace and has its "cold junction" (or point where the flexible leads begin) inserted into a beaker of ice water. This thermo-couple measures the temperature inside the furnace and actuates the recording instrument of the electric pyrometer, the recording arm of which makes a continuous record automatically on its circular chart.

The recording pyrometer is equipped with the patented semi-transparent smoked chart and a special vibrating device which brings the sensitive surface of the chart in contact every half second with the recording arm of a special Weston electrical movement. As friction between the recording arm and the chart is eliminated, a perfectly accurate record is obtained directly without the use of relays or other complicated devices. A chart of special graduations covering a range of 2,000 degrees Fahr., as shown in Fig. 3, is furnished with this outfit. In order that very quick variations in temperature may be recorded, this chart is arranged to revolve once in 60 minutes.

The special design of this laboratory unit makes it convenient for measuring the recalescent points of steel, or, in other words, the temperature at which a molecular transformation occurs below which steel cannot be hardened. To obtain a record of the recalescent points of a lot of steel, a small sample is selected, of cylindrical form about 7/16-inch in diameter, and about 1½ inches long. A hole ⅛ inch in diameter and ¾ inch deep is drilled into the end of the sample. After the electric furnace has been heated up by turning on the current, this piece of steel is inserted into the top of the furnace and the tip of the thermo-couple is introduced into the hole of the sample. As the steel is gradually heated up by the furnace, the rising temperature inside it will be recorded on the chart. After the temperature has been raised as far as desired, the piece of steel may be withdrawn from the furnace without disturbing the couple and as the steel cools its falling temperature will also be recorded on the chart.

The records of these rising and falling temperatures will be shown as curves on the charts on which the recalescent points will be easily discovered. Fig. 2 shows a chart with four of these curves made with four different samples. Sample No. 2 was wrought iron and its heating and cooling curves show no points where the rise and fall of temperature was retarded. Sample No. 7, on the other hand, shows two of these points, one going up and one going down. Sample No. 7 was 1.25 per cent carbon steel and was treated in exactly the same manner as sample No. 2. The record for No. 7 shows two points of retardation, one for heating at about 1,300 degrees Fahr., and the other for cooling at about 1,240 degrees Fahr. This shows that to harden this kind of steel, a temperature higher than 1,300 degrees Fahr., should be used. Sample No. 19 was a low carbon steel having different recalescent points. Sample No. 18 was cast iron and shows a point of retardation only.

It will be observed by reference to Fig. 3 that the complete test of each

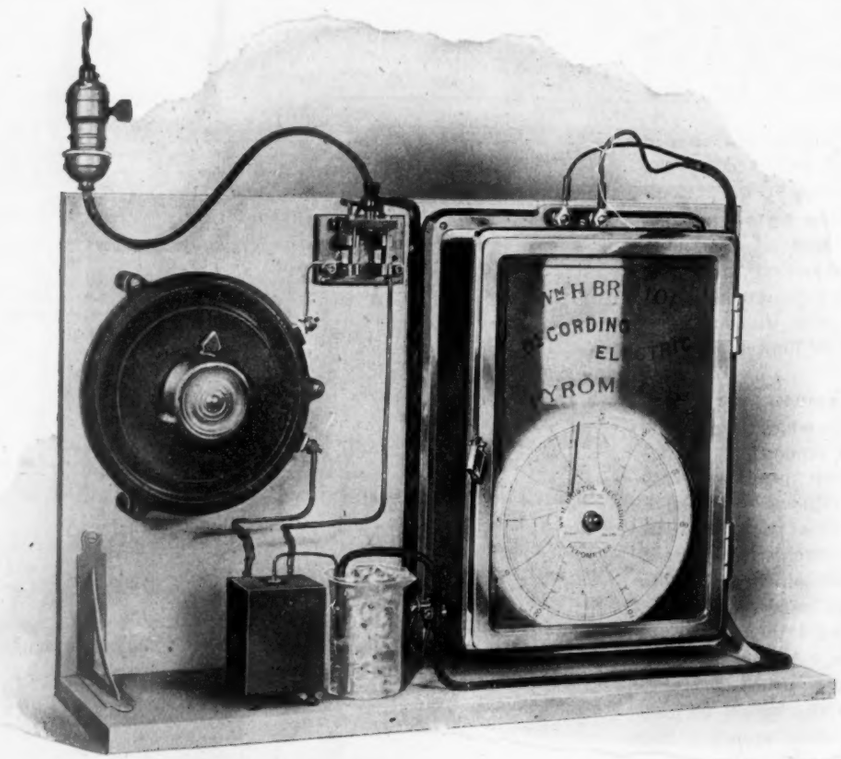


FIG. 2—NEW LABORATORY ELECTRIC FURNACE AND RECORDING PYROMETER OUTFIT FOR DETERMINING RECALESCENT POINTS OF STEEL.

sample was finished in less than 15 minutes after starting with a cold piece of steel, and that the critical points of heating and cooling curves were recorded within seven minutes

FIG. 3—RECORDING PYROMETER CHART SHOWING RECALESCENT POINTS OF STEEL AND IRON AS DETERMINED BY MEANS OF THE SPECIAL LABORATORY OUTFIT IN FIG. 2.

of each other. It has been found by experience that the curves obtained from these small samples with the outfit have the same characteristics and give the same results as those obtained by using large masses of metal which should require considerable time for heating and cooling.

From the curves and recalescent points shown on the chart in Fig. 3, it is evident that the temperature which would be right to harden one kind of steel would not be the right one to produce good results with another kind of steel. By making tests like those described above, the manufacturer can find out what temperature is the best one for him to use in hardening each particular lot of steel. The old-fashioned idea that steel could be hardened by guesswork is fast giving away to the realization that a piece of steel may become either worthless or precious according to what heat treatment it receives.

The special laboratory outfit described above is being manufactured by Wm. H. Bristol, 45 Vesey street, New York.

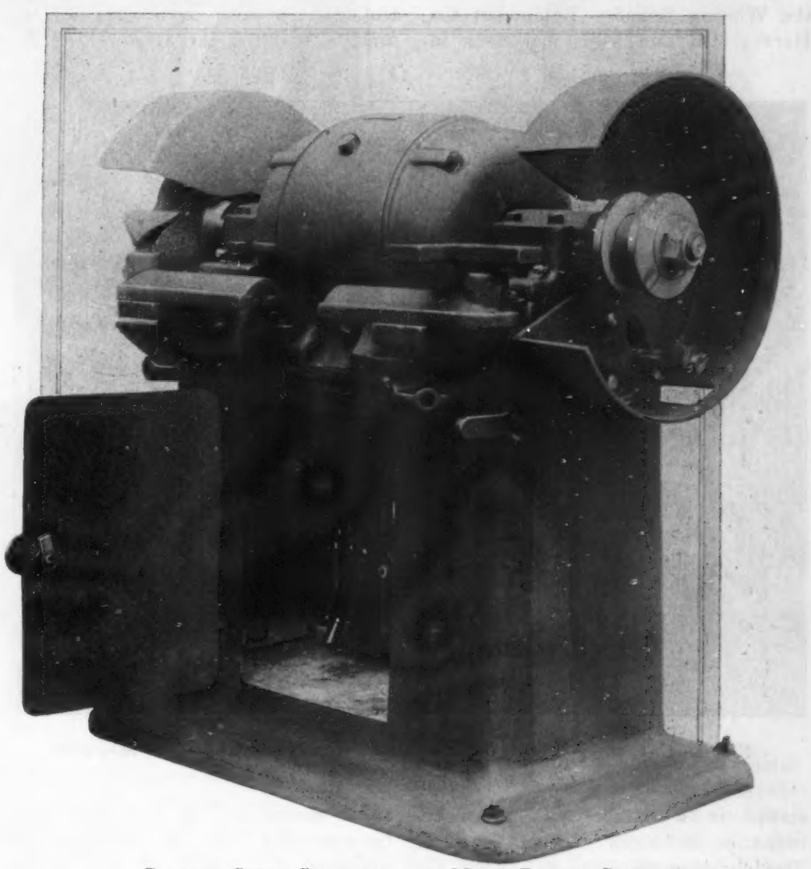
An extensive list of second hand machinery is being disposed of by the Pope Mfg. Co. at its plant at Westfield, Mass. This includes about $60,000 worth of lathes, drill and punch presses, milling machines, etc.

THE RANSOM SPEED CONTROLLER FOR MOTOR-DRIVEN GRINDERS.

As grinding wheels wear, it is necessary to speed them up in order to keep the peripheral speed of the wheel right, and in order to obtain the maximum amount of work with the least wear. The usual method of accomplishing this has been by the use of cone pulleys, variable speed motors, etc. These methods have been more or less unsatisfactory, as but few operators will take the time or trouble to figure out the proper number of revolutions that an emery wheel of given diameter should run in order to give the best results. The usual practice is to increase the speed by guess, with the result that the wheels often run too slow or too fast.

The device brought out by the Ransom Mfg. Co., Oshkosh, O., and here illustrated, is automatic in its action and gives a speed variation of 75 per cent. This is accomplished by means of external field control on the motor and causes the peripheral speed of the wheel to be maintained constant until it is practically worn out.

The speed of the wheel is regulated by a gage or roller situated directly under the wheel and mounted on a transverse rocker shaft running the length of the machine. These rollers are set so that they touch or nearly touch the wheels as they wear down, and the adjustment of the rollers is accomplished by means of an arm connected to the transverse rocker shaft, which comes forward, as shown



RANSOM SPEED CONTROLLER FOR MOTOR DRIVEN GRINDERS.

in the illustration, and which is in easy reach of the operator.

The adjustment of the rollers automatically moves the arm of a field rheostat in the base of the machine, in this manner cutting out resistance coils one after the other in the motor circuit, regulating the speed of the motor for the particular grinding wheel on the machine. If one wheel on the machine wears down faster than the other, the speed is regulated by the larger of the two, since it is impossible to move the roller on one end only. This prevents the machine from being run too fast for the larger wheel and eliminates any danger of bursting it. This speed controller can be attached to any of the Ransom motor-driven grinders, which are ground for direct current.

CUPOLA CHARGING MACHINE.

Foundries melting continuously as well as those operating large cupolas are gradually discarding the slow hand method of charging their furnaces. On many floors, cranes have been installed to lift the boxes, while several plants have replaced the boxes with scoops, which are raised at one end and discharge their contents into the cupola.

A cupola charging machine, built by the Whiting Foundry Equipment Co., Harvey, Ill., and which has been installed in a number of car wheel foundries, is shown in Figs. 1 and 2. The charging cars are run onto the platform of the machine located in front of the charging door, as shown in Fig. 1. The car is fastened to the platform by a hook which engages an eye on the bottom of the side sill. The platform is tilted at an angle of about 40 degrees, by an air hoist controlled by a lever at the side of the furnace, and the car assumes the position shown in Fig. 2, a steel plate lip extending from the charging door prevents the falling of any of the material outside of the cupola.

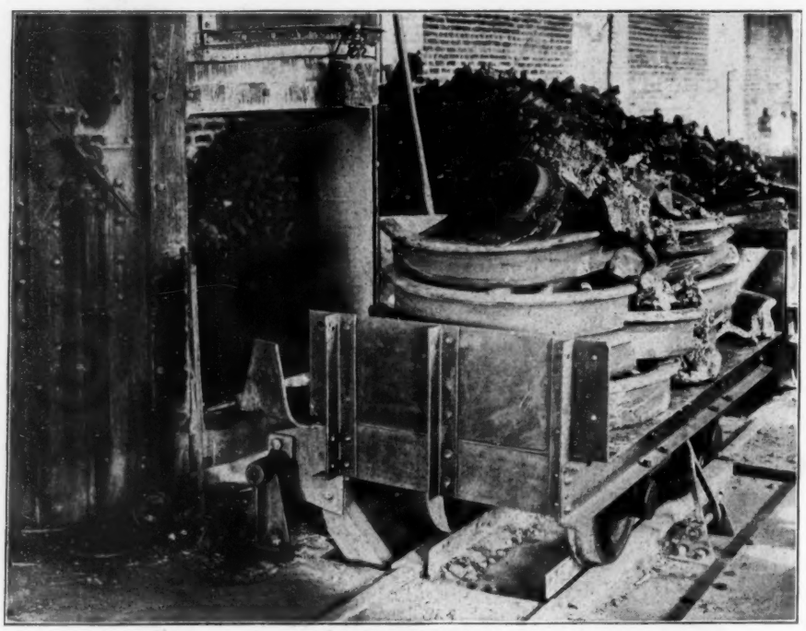


FIG. 1—CAR IN POSITION ON PLATFORM OF CUPOLA CHARGING MACHINE

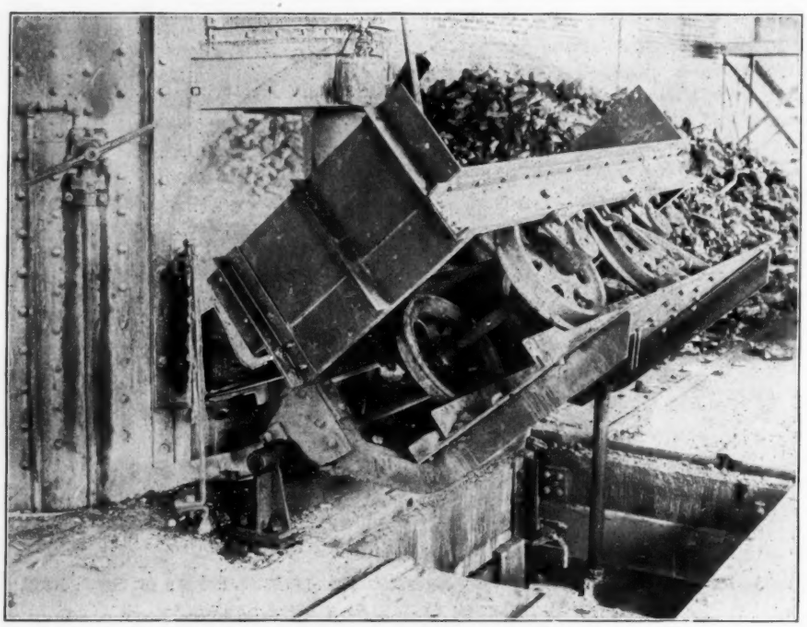


FIG. 2—CAR TILTED BY CHARGING MACHINE

The machine can be easily operated by two men. Installations have recently been made in the car wheel foundries of the American Car & Foundry Co., Madison, Ill.; Dickson Car Wheel Co., Houston, Tex., and the Canada Car Co., Montreal.

The St. Louis & San Francisco railroad is making rapid progress in erecting its large new shops at Springfield, Mo., in which will be concentrated all car building and repairing work. The buildings, which are expected to be completed by March 1, include a machine and erecting shop, 173 x 566 feet; erecting forge shop, 102 x 245 feet; boiler and tank shop, 117 x 344 feet; coach shop, 207 x 303 feet; paint shop, 182 x 183 feet, and power house, 117 x 160 feet. An 80-foot transfer table will be installed with a 1,338-foot runway, operated by third-rail electric system. In the erecting bay of the erecting shop will be a 100-ton and a 15-ton crane, and in the heavy machinery bay a 10-ton crane. The boiler shop will be equipped with 30 and 10-ton cranes, and six boilers with combined 2,400 horsepower. A 10-ton crane with a 70-foot span to operate on a 700-foot runway in the open will transfer the machinery, material and cars from building to building. Electricity will be used for power.

John Brouch, aged 83, died at Trenton, N. J., recently, after an eventful career as an iron molder and inventor.

HEAVY TOLEDO PRESS WITH MOTOR DRIVE.

The illustration herewith shows a heavy press of great power with direct connected motor drive, built by the Toledo Machine Tool Co., Toledo.

This press is one of a large number of sizes ranging in weight from 2,000 to 110,000. The machine illustrated is of the latter weight. It is known as the single-pitman straight-sided "Toledo" No. 59¾. It is designed and built for making steel stampings for automobile parts and similar work. The brake drums of quarter inch steel plate, as well as the flanges and other automobile parts are produced with this machine.

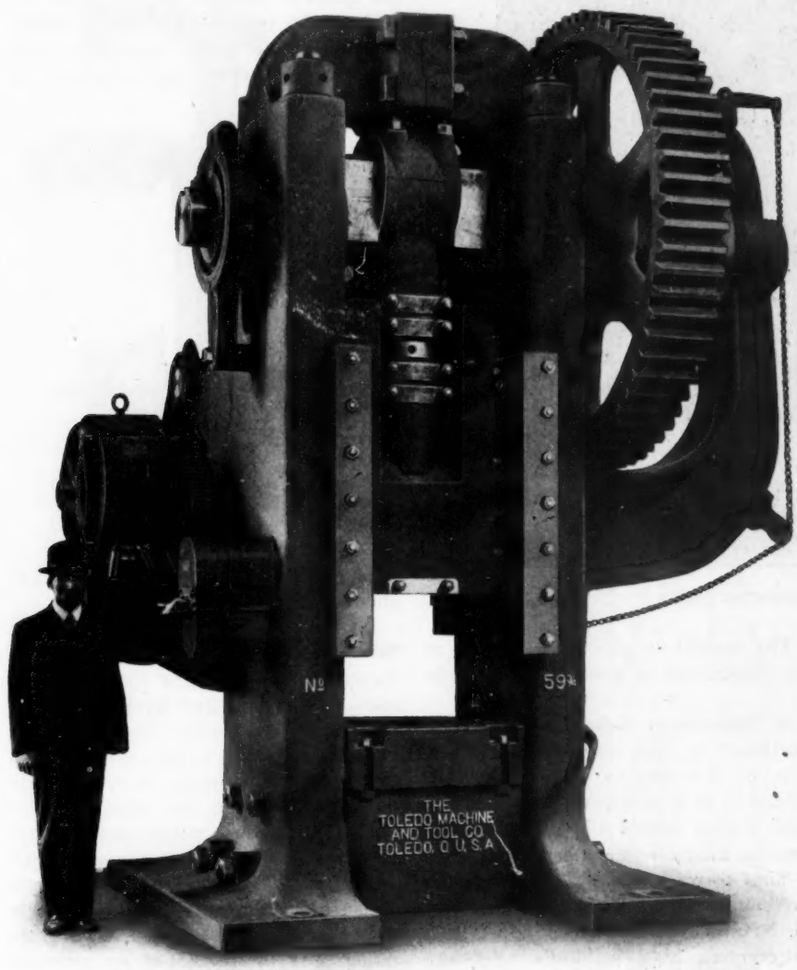
The capacity of the tool is for working cold steel plate as heavy as ⅜-inch thick. The drawing and reducing operations can be performed to better advantage on this style of machine than on other forms of presses where extremely heavy plates are used in making stampings. This is made possible by resorting to the cupping and reducing dies constructed to suit the work, and eliminating entirely the use of blank holders which are necessary and so commonly used on the thinner gages of metal. The press illustrated is also adapted to embossing and forming heavy plates where great power is required.

This machine can be fitted with a stroke or slide motion up to and including 24 inches. The machine illustrated has a stroke or slide motion of 14 inches. This press differs from those formerly built in that it has a three-piece frame construction securely tongued or bolted together. The bolts fit in reamed holes. In addition to this the frame or housings are reinforced with heavy steel rods shrunk into position. These rods pass up on the inside of the housings.

The press is fitted with a three engagement block clutch with an automatic releasing mechanism and gravity control. This eliminates entirely the use of springs for disengaging the clutch, insuring greater safety and more positive action.

Some of the measurements of the press are as follows:

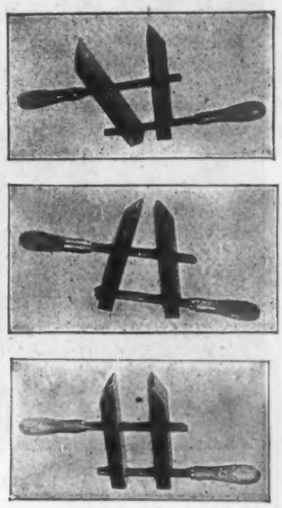
Complete weight as illustrated about	100,000 pounds
Diameter of large gear	91 inches
Diameter of fly wheel	62 inches
Weight of fly wheel	2,000 pounds
Dimensions of bed, area	38 x 38 inches
Stroke or slide motion	14 inches
Distance bed to slide all up	31 inches
Adjustment of slide	6 inches
Ratio of gearing from motor	100:1
Horsepower of motor	50
Extreme height over all	196 inches
Floor space occupied	138 x 156 inches



HEAVY TOLEDO PRESS FOR MOTOR DRIVE.

THE THOMPSON PATENT CLAMP.

The Thompson patent clamp, here illustrated, is a device which has just been placed upon the market by the Erie Stamping & Mfg. Co., Erie, Pa. A few of its advantages are as follows: The jaws are made in the form of a channel and of steel, making the clamp very strong. It is lighter than a wooden clamp, and glue will not adhere to the jaws or spindles. The jaws can be adjusted to any angle, practically making it a universal clamp. The spindles have both a right and left hand thread, rendering the clamp rapid in operation. On account of the right and left hand screw, a tight hold can be obtained with small power. Another desirable feature is that the jaws are made to overlap.

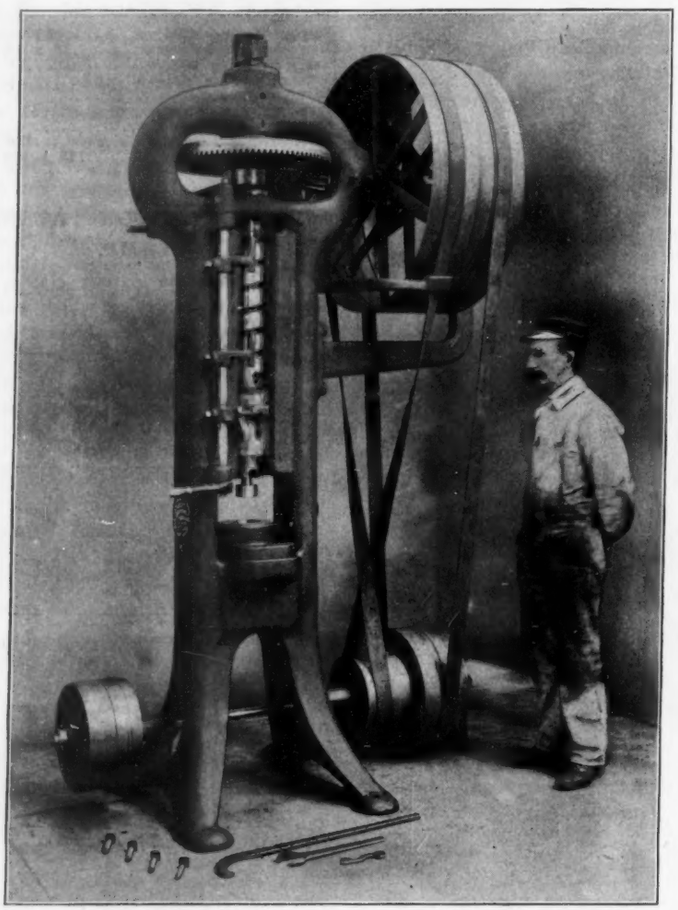


THE THOMPSON PATENT CLAMP.

As the clamp is made of metal throughout, it is practically unbreakable. The jaws are polished and perfectly smooth, thereby avoiding the marring of the finest surfaces. These clamps are made in five sizes.

A POWER SCREW RE-DRAWING PRESS.

The press shown in the accompanying illustration is designed for deepening or re-drawing shells, tubes, etc., from shallow shells previously cut and drawn from flat sheets of discs. It is known as press D333 by the maker, the Ferracute Machine Co., Bridgeton, N. J. It is intended for sheet-metal shells and tubes up to 24 inches deep, and will receive work as large as 5 inches in diameter through the bed.



THE FERRACUTE REDRAWING PRESS.

The press is of pleasing design, with its heavily rounded corners, being a single casting. The steel screw, 5 inches diameter, is driven by a phosphor-bronze nut set in the center of the large gear. The driving mechanism is similar to that on an ordinary planer, the pulleys being arranged to give a downward motion of the screw of about 11 feet per minute and a return motion of about 17 feet. The stroke can be set at any length up to 30 inches, and the press can be stopped at any part of the stroke by means of the shifter. The driving pulley on the lower shaft is 9 inches diameter, and its speed is 700 revolutions per minute.

The Ferracute Machine Co. also builds a double-ended horizontal screw press for work of about the same diameter and depth but arranged for using dies at each end, thereby utilizing the return stroke.

The weight of the press shown in the illustration is about 3,500 pounds.

A "Skyscraper School."—The latest "wrinkle" in the way of an institution of learning is the "skyscraper school." It is conducted by the West Side Young Men's Christian Association, in Fifty-seventh street, New York. It aims to train men for a work that is becoming more and more important in New York and other cities, that of erecting high buildings. Successful architects, engineers and contractors have direction of the new school. Instruction is given in structural engineering, structural draughting and detailing, estimating, plan reading, and general building construction. The students are taught to work out plans, and to translate those plans into prices, materials or the completed building.

SOME NEW SENSITIVE DRILLS.

The accompanying illustrations show two new sensitive drills brought out by the Tschudi-McBarron Machine Co., Dayton, O. Fig. 1 illustrates the 10-inch sensitive bench drill, which is a particularly handy tool. The arm of the tool is a single casting carrying the driving pulleys, spindle, table and an idler pulley for tightening. The machine is light in weight and requires but small space. The total height of the machine is 24 inches and the distance from the column to the center of table is 5⅛ inches, the table itself being 8 inches diameter. The spindle, which is ⅝-inch diameter, has a vertical travel of 1¼ inches, while the table has a vertical adjustment of 4½ inches. The greatest distance from spindle to base is 9 inches and the greatest distance from spindle to table is 7½ inches. The speed ranges from 1,000 to 2,000 revolutions per minute. The floor space required is 9 x 7 inches and the net weight about 50 pounds.

FIG. 1—TSCHUDI-MCBARRON BENCH DRILL.

Fig. 2 illustrates what the maker calls the "Excelsior" friction disc-driven drill. This is a tool requiring small floor space and having a rather wide range of work. The column is graduated its full length in a vertical line, making it possible to set the center of the table in line with the spindle at any point within vertical adjustment. The table is counterbalanced by a weight in the column, which is hollow, and can be easily raised and lowered and swung to either side by means of an attached hub. The speed variation of the spindle is obtained either by means of the cone pulleys, or by the friction driving disc, the adjustment of which is obtained by means of the rod shown at the top of the drill and which is fastened in place by means of the set screw shown. The driving wheel of the friction is built up of paper clamped between two steel discs.

This is especially durable and does not soak oil, thus preventing all slipping on the friction plate. The thrust of the spindle is taken on a ball bearing thrust collar and the friction plate is provided with a ball bearing hub. Angle iron attachments are on the table, thus eliminating the use of a separate angle plate. The greatest height from spindle to base of the machine is 40½ inches, and the greatest height from table to spindle is 33½ inches. The table is 10 x 10

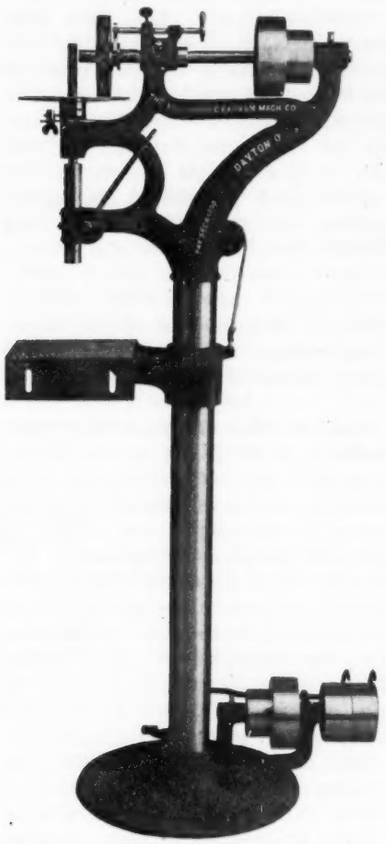


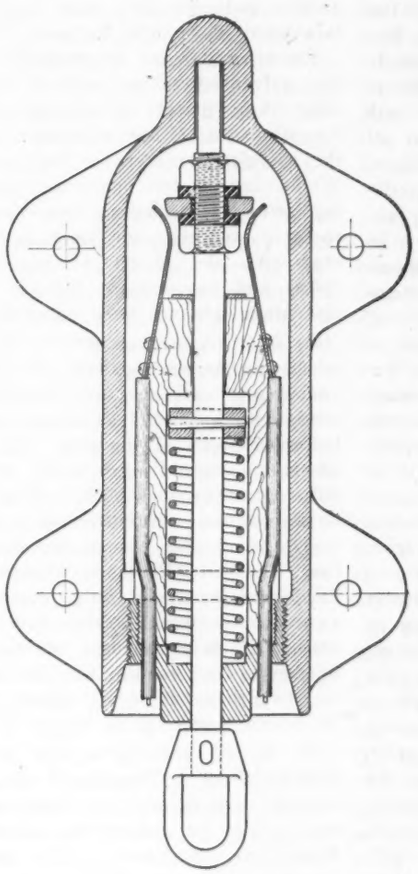
FIG. 2—TSCHUDI-MCBARRON 10-INCH SENSITIVE DRILL.

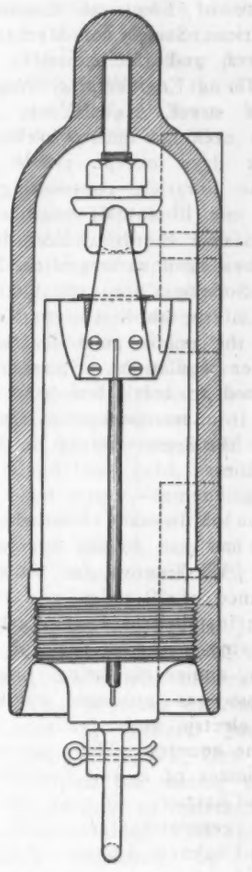
inches and the diameter of the column is 3½ inches and the distance from column to spindle is 7¾ inches, allowing the machine to drill to the center of a circle of 15½ inches. The smallest diameter of the spindle is ¾-inch and it is bored for a No. 1 Morse taper. The speed range of the machine is from 200 to 1,500 revolutions per minute. The size of the base is 12 x 20 inches or 20 inches diameter. The net weight is 225 pounds.

C. Ormsby & Co., Ltd., galvanized iron workers, of Toronto, have assigned to Rutherford Williamson. The company started business about a year ago on a capital of $20,000. The works have been closed down.

ELECTRIC PULL SWITCH FOR MINE SIGNALING.

The accompanying illustrations show outside and sectional views of an electrically operated pull switch for signaling from mine shafts to the surface which is being manufactured by the Quincy, Manchester, Sargent Co., Chicago. The apparatus has been thoroughly tested out in the western mines, operating with an easy positive action and with particular satisfaction under conditions of excessive dampness. As indicated in the sectional view it is a make and break device where the armature held by lock nuts on a central rod is pulled up against the contacts by the signal cord. A spiral spring acting against the signal pull breaks the contact quickly and gives a clean cut signal. The switches can be located at any level or point from which it is desired to signal. They are well insulated with wood, rubber and vulcanized fiber and current may be supplied from any convenient source. The simplicity and positive action of the switch makes errors of transmission in signaling practically impossible.

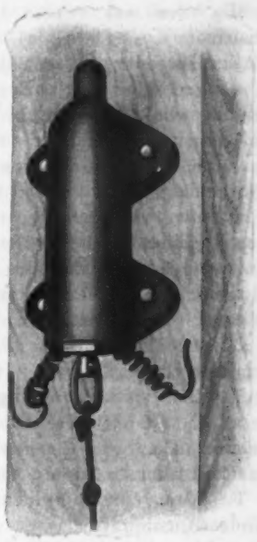




SECTIONAL VIEWS OF ELECTRIC MINE PULL SIGNAL.

ORGANIZE CLEVELAND SECTION OF A. I. E. E.

About 60 members and associates of the American Institute of Elec-



ELECTRIC MINE PULL SIGNAL.

trical Engineers met in the Electricity building of Case School of Applied Science, Cleveland, Monday evening,

Oct. 28, to perfect an organization to be known as the Cleveland section of the American Institute of Electrical Engineers. The meeting was called to order by Prof. H. B. Dates and Albert M. Allen was elected temporary chairman.

Mr. Allen introduced Paul Spencer, of the United Gas Improving Co., Philadelphia, who addressed the meeting, outlining the advantages which would accrue to the men then present by organizing as a regular branch of the institute. A committee on by-laws was appointed and reported later in the evening a set of by-laws which was adopted. The following officers were elected: Chairman, Prof. H. B. Dates, Case School of Applied Science; secretary, F. M. Hibben, Cleveland Electric Illuminating Co.; managers, C. W. Ricker, Cleveland Construction Co.; A. C. Eastwood, Electric Controller & Supply Co.; and C. E. F. Alm, consulting engineer, Cleveland. A committee was appointed to consider the advisability of admitting to the section engineers who are not members of the American Institute of Electrical Engineers.

Libraries Open Evenings.—The reference libraries of the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, and the American Institute of Mining Engineers, 29 West Thirty-ninth street, New York, are now open evenings until 9 o'clock on all week days except public holidays. These libraries, constituting practically one library of engineering, situated near the New York library, in the new headquarters of the Engineering Societies, are available to members of the above societies, engineers, and the public generally, subject to proper regulations. Strangers are requested to bring letters of introduction from members or to secure cards from the secretaries of the respective societies.

The Milwaukee-Northern electric line has just begun operation from Port Washington to Milwaukee, a distance of 29 miles, and the power plant installed at Port Washington is receiving a great deal of attention from engineers, being one of the largest gas producer engine plants for electric street railway operation in the country. There are two units, duplicates of a unit installed by the Allis-Chalmers Co. at McKeesport. The generators are 1,000 kilowatt, Allis-Chalmers 3-phase, 25-cycle alternators, direct connected to Allis-Chalmers gas engines.

PRICES ARE EASING

In Finished Lines in England—Effect of Importations Felt

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Oct. 26.

The finished iron and steel trade is in a peculiar position. So far there has been very little shortness of work, but prices are easing a little, owing to the lack, or small tonnage, of new orders. The steel market is weakened by the falling off in orders for rails, and generally speaking the fears of a railway strike, which now seems to be imminent, are restricting orders for railway wagons, nuts and bolts, and material generally, while contracts for constructional engineering seem, for the time being, to have ceased altogether. The steel trade is also feeling the effect of Belgian and German importations in a further weakening of billets, and the same influence is to a less extent affecting the iron bar department, as Belgian firms are quoting bars at about 15s below the local figure. But the makers cannot promise delivery under two months, and by that time it is possible British iron may be selling at the Belgian figure. Local buyers have little confidence in the quality, and very little trade is therefore being done with Belgium.

There was some expectation that the galvanized sheet makers would raise their prices 5s, following the American lead. But the meeting of the associated makers in London on Wednesday merely confirmed existing rates. Negotiations are reported to be in progress with American makers, with the object of regulating prices and production. But no definite stage has yet been reached.

A slight improvement is reported in hoops, bedsteads, and gas strip, and some makers are optimistic enough to speak of an improvement before the end of the year. On the whole, this would seem to be an unduly optimistic view. Several of the largest works are curtailing production, and among others the men at the Derwent Works, Workington, have been employed only four shifts a week for some weeks, and have now received seven days' notice terminating the existing engagements, so that they are now subject to a 24 hours' notice.

W. H. Edwards, proprietor of the Duffryn Steel & Tinplate Works, has invited tenders for the erection of new works for galvanizing sheets at Morriston, near Swansea. The project involves the expenditure of about a hundred thousand pounds, and it is expected work will be found for about 300 hands.

Combines are still in the air, the latest being a report from Glasgow that a scheme has been drawn up by the Scotch Steelmakers' Association under which it is expected that contracts will be pooled and better prices obtained. The suggestions are to be submitted to the various producers. The object is to put an end to indiscriminate competition for export business, and to keep export prices on a level with those of the home trade.

Messrs. Baldwins, Ltd., who held their meeting last Thursday, report an increase in their net profit of £45,356 over that of a year ago. The ordinary dividend which two years ago fell to 1¼ per cent, and last year was 2½ per cent, is now further increased to 5 per cent. The appropriation to reserve is increased from £30,000 to £50,000, and the balance carried forward, which was £12,498 a year ago, is now £25,456. Messrs. Baldwins, Ltd., is one of our largest combinations, with an authorized share capital of £850,000.

Students Visit Plants.—Thirty-three students of the senior mechanical engineering class of the University of Illinois, on their annual inspection tour, visited the steel construction and machine plants of Milwaukee last week. While there the students witnessed the operations of the works of the Fred M. Prescott Steam Pump Co., the Allis-Chalmers Co., Pawling & Harnischfeger, the Nordberg Mfg. Co., the Falk Co. and others. The party was in charge of L. P. Breckenridge, professor of mechanical engineering; J. C. Thorpe, assistant of steam engineering, and J. H. Gill, assistant professor of machine construction.

As a result of the recent fire which destroyed the carpenter shop and a storage building at its Pencoyd works, Philadelphia, the American Bridge Co. is shortly to purchase considerable erecting equipment, chiefly small tools. These purchases will be made by H. F. Lofland, general manager of erection, with offices in the Pennsylvania building, Philadelphia.

The Neill Foundry property at Portsmouth, O., appraised at $9,000, was offered by the sheriff Oct. 26 but only the machinery, patterns, etc., were sold, going to Charles J. Bowen, of Guthrie, Okla., representing Charles A. Martindale, formerly of Lucasville, O., who is interested in a foundry at Guthrie.

UNION MEN IDLE

While Non-Union Molders Work—New Industries of the Buffalo District.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square,
Buffalo, Nov. 5.

A canvass of the local foundries brings to light a situation that is not entirely new to the trade. While the foundries are comparatively busy and the independent, or non-union employes, are making more money than the union men ever earned, there are many molders walking the streets in search of work. This situation is accounted for, it is said, by the unsuccessful attempts of the union to wipe out the "open shop policy" maintained by many of the plants. It has been the plan of the union, it is said, to have its members secure employment in the "open shops" and quietly endeavor to unionize the independent workers, and when sufficient progress has been made in this line, request the respective managements to discharge the non-union men. How well this plan has succeeded may be cited in an instance that occurred here last week. In the East Buffalo Iron Works, owned by Farrar & Trefts, where, it is understood, the unionization plan has been carried on for some time, the union men, through First Vice President Kehoe of the International Molders' Union of North America, requested the management to discharge the independent workers. The result was that the union men of that plant joined the ranks of the idle and are now in search of work.

Instances of this kind are jointly responsible for the retarded buying movement, but it is hoped that satisfactory settlement will be made soon and every obstacle removed from the progress of the iron market.

The Wickwire Steel Co. is now prepared to commence the construction of buildings that will compose its $1,000,000 plant, the foundations for which have just been completed on Rattlesnake Island, in Niagara River. Upwards of 300 carpenters and laborers will be engaged in the work this week. It is expected the buildings will be nearly completed early next spring.

Local officials of the Pennsylvania Railroad stated today that the company has had in use for the past 18 months steel rails made by the Spanish-American Iron Co. The officials state that the rails in service on the famous horseshoe curve have worn considerably better than have the ordinary standard rails of the same weight manufactured from other ore.

Explosion of naphtha at the plant of the Buffalo Brake Beam Co. in this city recently entailed a loss of about $25,000, and for a time threatened with destruction the property of the Acme Steel & Malleable Iron Works, which adjoins the burned building on the west. Little damage, however, was done to this property save from water. Machinery used for the heating and pressing of brake beams was practically ruined. The floors of the building fell, but the walls will stand. A new and larger plant for the company, which is controlled by the Vanderbilt interests, is rapidly nearing completion near the works of the Lackawanna Steel Co.

A fine new sheet bar mill has just been completed by the Lackawanna Steel Co. It was placed in operation recently and turned out tonnage to its maximum capacity, something unusual for new mills. The new mill is known as No. 8 and the entire output is now being used by the Seneca Iron & Steel Co., whose plant is rapidly nearing completion.

An involuntary petition in bankruptcy has been filed in the district clerk's office by the creditors of the Gillie Engine & Machine Co. of Tonawanda. The petitioning creditors and their claims are: The National Bank of Commerce, Kansas City, $1,803.94; J. and T. Charlton, North Tonawanda, $82.47; Knapp, Cramer Hardware Co., North Tonawanda, $60.06, and the Depositors' Savings & Trust Co., Cleveland, O., $1,276.35.

Fires were started Oct. 28 in the plant of the Niagara Forged Steel Co., located at Depew, opening another new and important industry in this territory. The corporation is backed by Pittsburg capital and will manufacture railway specialties, such as anti-spreading devices, brake beams, ties and plates and steel billets. The concern is capitalized at $300,000. Its plant occupies a tract of 13 acres. Two mills, a forge mill and a billet mill, are now complete and fully equipped with machinery. The first heat will be drawn on Wednesday of this week. Other mills are now under construction and are expected to be completed by next spring. W. H. Woodcock, formerly of Pittsburg, is president and mechanical expert of the company.

General Manager J. R. Houston, of the Portsmouth Steel Co., denies the newspaper reports to the effect that the company had contemplated the erection of a boiler shop to erect boilers instead of selling plates.

OPEN SHOP PRINCIPLE.

To Be Maintained by Kenosha, Wis., Manufacturers—Labor News.

To declare and maintain the open shop principle in their plants the manufacturers of Kenosha, Wis., have organized the Manufacturers' Association of Kenosha, and have enrolled practically every manufacturer in that city as a member of the new body. Thomas B. Jeffery, president of Thomas B. Jeffery & Co., has been elected president, and W. L. Yule, secretary of the Badger Brass Mfg. Co., which recently declared for an open shop, is the secretary. The other officers are: Vice president, Z. G. Simmons Jr., and treasurer, H. L. Shearer. The executive committee includes the officers, Walter J. Frost and Charles T. Jeffery.

The objects of the association as set forth in the constitution and by-laws are:

"To protect its members in the right of freedom of contract in the employment of labor against the restriction or limitation of output and against strikes and boycotts.

"To maintain a free employment bureau for labor."

Among the companies represented in the association, which includes employers of about 6,500 men, are the following: Thomas B. Jeffery & Co., the Chicago Brass Works, the Frost Mfg. Co., the Badger Brass Mfg. Co., the Windsor Spring Co., and Frank L. Wells.

Labor Notes.

The Alan Wood, Iron & Steel Co. has posted notices of a wage reduction at its mills in Conshohocken, Pa. The decrease will average about 10 per cent, reducing wages to the level which was in effect before the advance granted last February, but it will not be a horizontal cut.

Twenty-five riveters employed at the Mare Island navy yard, near San Francisco, have struck, demanding a piece-work schedule instead of the present scale of $3.92 a day for riveters, $3.20 for helpers, and $2.80 for heaters.

A sweeping injunction against John Mitchell, president; T. L. Lewis, vice president, and the district officers of the United Mine Workers of America, was issued by Federal Judge Dayton at Phillippi, W. Va., Oct. 24. The order restrains the mining officers from organizing or interfering in any way with about 1,000 non-union miners employed by the Hitchman Coal Co., Glendale Coal Co. and other mining companies.

AMERICAN CAR & FD'Y CO.

Not Decided About Removing Offices —Will Operate in Detroit.

(Special Correspondence.)

St. Louis, Nov. 5.—The American Car & Foundry Co. is rapidly installing its St. Louis offices in the Syndicate Trust building, a new 18-story structure at Tenth and Olive street. The company will occupy the entire fifteenth floor, having abandoned quarters in the Lincoln Trust building. J. M. Buick, vice president of the company, says that the company has not fully decided whether it will remove the St. Louis offices to Chicago, as reported, or remain in the former city.

Regarding the further report that the company would lay off approximately 2,500 men in its Detroit plants on Dec. 1, Mr. Buick informed a representative of THE IRON TRADE REVIEW that the company would continue to operate both plants at Detroit, and that if any lay-off occurred it would not affect more than 300 workmen. A representative of the leading steel interest also informed THE IRON TRADE REVIEW that his company was taking as many contracts from the American Car & Foundry Co. as it could comfortably care for.

GERMANY'S MACHINERY TRADE.

Consul Thomas H. Norton, of Chemnitz, furnishes the following report to show the steady growth in the export trade of Germany's machine industry, which he says is attracting general attention:

For the first seven months of the current calendar year there was an increase of 17 per cent over the corresponding period of 1906. It is evident that this is not due to any falling off in the demands of the home market, as all branches report an excess of domestic orders, and in addition the import of machinery from abroad has increased 11 per cent during the same period, showing that foreign competition encounters less difficulty than usual on German territory. The total weights of machinery imported and exported during the first seven months of the last three years are as follows:

	Imports. Short tons.	Exports. Short tons.
1905	54,259.17	183,379.41
1906	59,922.02	172,006.77
1907	66,632.54	202,202.89

Compared with 1905 there is an increase of 23 per cent in the imports and of but 10 per cent in the exports. Current prices would show, however, a greater relative increase in the value of exports. The ratio of increase in exports during the past seven months has also been steadily growing. In July there was an increase of over 20 per cent, as compared with the same month in 1906. This growth in exports has been very unequal in the different categories of machines. It has been most marked in the case of machines for metal working, embroidery, cloth finishing, milling, and sugar manufacture. Thus, during the month of July, exportation was as follows:

	1906. Short tons.	1907. Short tons.
Machines for working metals	3,049.67	4,295.05
Steam engines	3,051.66	3,688.17
Flour and sugar machines.	1,535.09	2,246.87
Thrashing machines and mowers	1,985.03	1,896.98
Sewing machines	1,587.65	1,773.55
Locomotives	3,142.57	1,697.74
Embroidery and finishing machines	630.01	1,497.73

The rather striking decrease in the case of locomotives is partly due to the fact that the figure for July, 1906, was abnormally large.

Chemnitz exports to the United States chiefly gloves, hosiery, knitting, lace, and tulle machines. The percentage of increase in these exportations is much greater proportionately than in the case of German machinery as a whole. Some comparative values of machinery exported from the Chemnitz consular district to the United States are shown in the following table:

	1906.	1907.	Per cent increase.
Fiscal year ending June 30	$197,307	$271,735	37.70
Month of July	18,867	33,404	77.04
Month of August	26,212	47,813	82.40

RECEIVERS FOR BALTIMORE CAR COMPANY.

Upon an application filed by the Maryland Car Wheel Co. the affairs of the South Baltimore Car & Foundry Co., Baltimore, have been placed in the hands of receivers and Joseph R. Foard and Arthur G. Wellington have been appointed by the court in these capacities. The South Baltimore company has an authorized capital stock of $1,500,000, of which $500,000 is preferred. There is now outstanding $883,000 of the common stock and $314,000 of the preferred, making a total stock outstanding $1,197,000. The company's earnings last year showed up well, the gross being more than $9,000,000, and the profits, more than $500,000. There is no mortgage on the property. The indebtedness of the company, as set forth by the company in its answer to the petition for the appointment of receivers, totals $956,877.80, of which $300,852.50 is in notes for material, $308,500 in notes for borrowed money, $97,090.90 for unpaid drafts, and $250,434.38 for unpaid accounts. The present state of the money market, resulting in slow collections, is said to have caused the company's embarrassment. The officers of the company are: President, Howard Carlton; chairman of the executive committee, Charles T. Crane; vice president, J. Edward Harvey; general manager, John H. Farlow; treasurer, Carter G. Osburn; secretary, H. Milton Luzius. Subsequent to the appointment of receivers, a bill asking for the naming of a co-receiver was filed by the Canton Iron & Steel Co., Baltimore.

PROJECT IS POSTPONED.

Toronto, Can., Nov. 2.—The stringency of the money market has resulted in the postponement of the project of Moose Mountain, Ltd., for the building of an iron smelter in Toronto. D. D. Mann, representing the company in its negotiations with the city, now states that in view of present financial conditions he would not guarantee that anything could be done within a year. As regards the grade of Moose Mountain ore, concerning which there has been some question, Mr. Mann states that out of 14 samples analyzed, 10 showed over 55 per cent of metallic iron. One assay made by Prof. Coleman showed as high as 62.64 per cent, the lowest being 31.42 per cent.

Furnace About Ready.—The installation of the twelve big Atlas boilers at the new plant of the Ironton Iron Co., Ironton, O., has been completed and rapid progress is being made by the Olive Foundry & Machine Co. on the stove and other portions of the plant. The twin blowing engines of 1,343 horsepower each, which were purchased of the LaBelle Iron Works, Steubenville, O., have also been placed and connections are being made. The boiler and cast-house enclosures are yet to be reared, but the concrete construction in the big ore yard and the completion of the trestling is nearing an end. The company still has hopes of being able to blow in the new furnace very early in the new year.

Batcheller, Clarke & Batcheller, crane builders and machine tool dealers, have removed from 107 Liberty street, New York, to commodious offices on the fourth floor of the West Street building, 90 West street. They report the sale of a 40-ton crane, of 50-foot span, to a Louisiana concern for engine room installation.

PROBABLE EFFECT

Of Discovery of Cuban Ores Discussed by Prof. Wm. Kent.

In a letter to the *Baltimore News,* Prof. Wm. Kent, of Syracuse University, says:

"Replying to your favor of the 4th instant inquiring my views of the ultimate effect on the steel industry if it proves feasible to lay down ore at Baltimore at $1.20 per ton cheaper than it can be secured from the Mesabi region by the United States Steel Corporation, I would answer as follows:

"The question is not sufficiently definite to say at what point the United States Steel Corporation is to lay down its ore from the Mesabi region. If at Baltimore, then the Cuban ore would, of course, exclude the Mesabi ore. If at Pittsburg, it might be possible for the Steel Corporation to pay the freight from Baltimore on Cuban ore and bring it into direct competition with the Mesabi ore. If at Chicago, it would not pay to carry the Cuban ore there, and probably would not pay to carry the products made at Baltimore as far as Chicago to compete with those made at that point from Mesabi ore.

"If it can be proved that Cuban ore in sufficient quantities can be laid down at Baltimore at $1.20 a ton cheaper than Lake Superior ore can be obtained either at Chicago or Lake Erie, then no doubt a very great iron and steel industry would be built up in the vicinity of Baltimore. It will find its chief market along the Atlantic coast and in South America after the Panama canal has been opened and in trans-Atlantic markets. When the new barge canal is completed through New York state it will be possible for the United States Steel Corporation to get very cheap transportation on its products to the Atlantic seaboard, and it might be able thereby to ship its surplus products to foreign countries in competition with Baltimore. It would continue to hold the great bulk of the trade of the Central and Western States, leaving to Baltimore the trade in the Southern States, and it would probably divide the trade of Philadelphia, New York and New England. If the quantity of the Cuban deposit is as great as represented, and its quality as good, and it can be laid down in Baltimore as low as it stated, it will form the basis for one of the largest steel plants in the world, but I should not go as far as to say that it would make Maryland the center of the steel industry of this country, and perhaps of the world, as the clipping from your issue of October 4 says. It is a good thing for the country to have several great iron centers. East of the Mississippi we have Chicago, Lake Erie, Pittsburg and Birmingham. If Maryland is to become another center, it will be a good thing for a country at large and will not be a bad thing for the other centers, for the market for their products is bound to increase from year to year, notwithstanding any possible competition that may come from Baltimore."

INDIA'S FIRST STEEL PLANT.

Consul-General W. H. Michael, of Calcutta, advises that the first attempt to establish iron and steel works in India has just been started by a rich firm in Bombay, supported by other wealthy individuals, and by the government of India, the details beings as follows:

It starts out under what seems to be the most auspicious circumstances, and the proposed enterprise is receiving hearty acclaim from all over India. The location of the plant will be near Sini Junction on the Bengal Napgur railway, where there is abundance of water, and where iron ore, coal, and limestone can be assembled at low cost of transit. The government of India has authorized the construction of a broad-gage line from the proposed site and ore beds, a distance of 60 miles. On all government railways the cost of transportation in the interest of the plant will be put down to a mere nominal figure for a term of years, say, 0.15 of an anna (1 anna = 2 cents) per ton per mile. The government agrees to take at import prices 20,000 tons of steel rails annually for 10 years—in fact, agrees to do whatever is within its power to encourage the enterprise within proper business limits.

The capital is fixed at $7,725,000, and the output of the works will be about 200,000 tons, and the royalties to government for the first 30 years will be 1¼ cents per ton, and for the second 30 years 10 cents per ton. After careful calculation by competent accountants, the gross profits of the proposed works will be for the first year $805,000. The future income of the plant is based on the imports of iron and steel into India for 1905-6, for the classes intended to be produced by the company, which was 615,000 tons, and for the past 12 years 409,000 tons annually. The imports are in excess of the estimated output of the proposed plant, which at first will be 120,000 tons of pig iron, and the conversion of 85,000 tons thereof into 72,000 tons of finished steel. It is calculated that it will not cost to exceed $8,000,000 to erect and thoroughly equip a plant that will fully realize the foregoing figures.

Without doubt the enterprise will be pushed to an early realization, and India will have taken another long stride towards industrial independence.

I do not know just what American manufacturers of such machinery as is used in such a plant can do towards securing a share of the business, yet it would seem to me that with our prestige in the manufacture of iron and steel, we ought to be able to get some of it.

The name of the firm to approach on the subject may be learned from the Bureau of Manufactures, Washington, D. C.

THE JERSEY IRON MINES.

Henry K. Kummel, state geologist of New Jersey, in his annual report for 1906, recently from the press, states that the compilation of data in regard to the iron mines of the state, in charge of Dr. W. S. Bayley, will be ready for publication early in 1908. A detailed map of the Hibernia mines is being prepared and the report will be accompanied by other maps, both of the surface and of the underground workings of various mines.

The production of iron ore in New Jersey during 1906 was 542,488 tons, the largest reported since 1891. After that date, there was a rapid falling off, but for the past 10 years there has been a steady increase. The largest output reported in any one year was 932,762 tons, in 1882.

The active iron mines during 1906, according to Mr. Kummel, were the Washington and Ahles at Oxford; the Hurd, Richard and Hoff at Wharton; the Mount Hope mines at Mount Hope; the Hude at Stanhope; the Andover, DeCamp, Upper Wood and Wharton at Hibernia; the Dickerson at Ferro Mont; and the Peters at Ringwood. Developments were carried on at the Teabo and the Scrub Oak or Dell, but not to such an extent as to classify them as producers during 1906.

The caving system of mining is employed at the Ahles, Oxford, N. J., where the Basic Iron Ore Co. is operating. The ore is a mixture of magnetite and limonite, carrying about 4 per cent of manganese.

"At the Teabo mine," says the report, "a crosscut at the 800-foot level of the new shaft struck a 2-foot vein of rich magnetite at a distance of 27 feet in the hanging wall, and a thicker ore body on the footwall side at a distance of about 40 feet from the shaft. The shaft was then sunk 40 feet and crosscutting was again commenced to these ore bodies."

During the year 12 limestone quarries in the state were operated with an estimated production of about 460,000 tons, most of which was used as flux in blast furnaces and open-hearth steel furnaces. The state's zinc ore output was 361,330 tons.

SPECIAL RULING

On Car Service Asked by Furnace Interests—Railroad Notes.

The Ohio railroad commission is considering a number of complaints, filed by furnace men along the Ohio river, who say they are paying too much for car service charges, under the new car service rules promulgated by the commission some time ago. Before the state rules became effective, the furnaces operated under special Pittsburg rules, which relieved them of all car service charges. The commission is asked to make a special ruling for the furnaces similar to that for coal shipments for lake trade. It is said the conditions are similar. Consignments are made in train load lots for the convenience of the railroads and to help in unloading vessels at lake ports. They therefore reach the furnaces in larger quantities than can be handled within the free time limit. The commissioners admit the rules are not perfect in every respect and are apt to work hardships on some classes of business. They, therefore, are considering all complaints made by dissatisfied shippers with a view to changes that will make the rules justly fit all cases.

Want New Freight Class.

The Ohio railroad commission has been asked to establish a new class of freight, to be known as the seventh class, and to include such commodities as pig iron, coal, lumber, stone, grain, etc. These low grades of freight are now rated in the sixth class at stations where there have been no commodity rates to govern. The petition says that where the commodity rates do not govern, the charges for the transportation of these low grade commodities are excessive and result in discrimination in favor of places to which commodity rates have been granted. The commission is asked to establish the new class and also a distance tariff for it which shall be based on 25 cents a ton for the first 10 miles and under and an additional 5 cents a ton for each additional 10 miles.

Railroad Notes.

A total of 277 new industries, representing a capitalization of $16,915,300, with 12,640 employes, have been established along the Illinois Central system during the year ending June 30, 1907. With the exception of a few manufacturing plants located on joint tracks at competitive points, these companies were all located along Illinois Central rails.

The large new shops of the Atlantic Coast line, at Waycross, Ga., under construction since 1906, have been completed and most of the machinery installed. Nearly all of the buildings are of concrete, steel and brick, and the total expenditure for the improvement is estimated at $2,000,000.

A new freight car repair shop, 112 x 300 feet, has been completed at the shops of the Toledo & Ohio Central railroad, at Bucyrus, O. In addition to the new repair shop a boiler shop, saw shop and other new buildings have been erected and the round house enlarged.

The new car repair shop of the Philadelphia & Reading railroad at Rutherford, Pa., has been completed, but will not be put into service until the power house and viaduct, now building, have also been finished. The new shop is 100 x 200 feet and is fitted with all modern mechanical devices.

On account of the heavy repair work, railroads in the Pittsburg district have been given authority to increase shop forces. Division officials of the Baltimore & Ohio railroad have received instructions to add more men to the shops, and the Pennsylvania Railroad Co. has ordered 500 additional mechanics and laborers put on at the Altoona shops.

Work has been inaugurated on the construction of the new steel car repair shops of the Great Northern railroad at Superior, Wis. The new shops are 108 x 240 feet, and their erection will be followed by other extensive structures.

JEFFREY ELECTRIC LOCOMOTIVE.

The accompanying illustration shows a 25-ton switching locomotive built by the Jeffrey Mfg. Co., Columbus, O., for use in handling freight cars for the Cerveceria Cuauhtenoc brewery, of Monterey, Mexico.

This style locomotive takes the same electrical equipment as the mine type, the only changes being in the side and end frames and the addition of a platform and suitable cab to accommodate the conditions incident to surface work. The motors are of the water-proof steel frame type, having drum-wound armatures, laminated pole pieces, oil lubrication with auxiliary grease boxes and liberal wearing surfaces.

JEFFREY ELECTRIC LOCOMOTIVE.

These locomotives are built in sizes from 10 to 30 tons with two motors, and in larger sizes with three and four motors, arranged with rigid frame or with double trucks having flexible wheel base, depending entirely on the conditions.

The Jeffrey Mfg. Co., Columbus, O., is expected to be in the market soon for a number of tools for equipping the new addition to its machine shops which it is now erecting.

Stock Market Is In Calmer State

A less feverish feeling on the part of banking depositors, a narrower range of fluctuation in prices and a steady investment buying have combined to return a measure of confidence to the stock market within the week. There has been a steady undertone in the situation that is lending encouragement to the belief that the crisis in the stringency of money and credits has been temporarily passed at least. Though the semi-panicky situation of the previous week has been lacking in transactions in the period under review, the market's decline has not been wholly stayed, and drops in quotations have been more numerous than gains. In the narrow fluctuation, however, is seen the approach of sentiment to a calm and normal basis. The forced sales brought about by the recent banking troubles have resulted in an extremely heavy liquidation, but this is gradually being absorbed, and with the firm support of a large volume of buying for investment, the depressing effect is passing. United States Steel stocks have held comparatively firm in the week. In money conditions a very favorable development of the week has been the large gold import engagements. This movement now reaches $27,200,000, and as the greater portion of the gold is expected to arrive this week, a substantial support will be given the credit situation. Advances in rates by English and German banks have temporarily checked an increase of the import movement, however. In call money at New York, the maximum of the week was reached at 75 per cent, but the average was 20 per cent, against 50 per cent last week. In 60-day loans, New York, the week's average stood at 12 per cent, compared with 7 per cent a week ago. The extreme strain upon the banking resources caused by the recent disorders is clearly illustrated in the weekly statement of the associated banks of New York. The net reserve in the week was decreased $27,605,525, bringing the deficit in the reserve fund to $38,838,825, the largest deficit ever reported by the banks. This is compared with a surplus of $3,049,775 Nov. 3, 1906. Loans were increased $60,741,600 within the week and deposits increased $28,014,900. The actual cash holdings were decreased $30,601,800. The total trading on the New York stock exchange in the week reached 2,624,350 shares, against 4,946,740 shares last week, and 3,685,000 the corresponding week of 1906. In bonds, exclusive of government bonds, the sales of the week aggregated in value $13,242,000, against $17,750,000 last week, and $13,567,000 in 1906.

Copper Stocks.

Boston.—Butte Coalition, closed 15⅝, net gain in week 3⅛; Calumet & Arizona, closed 103, net gain 9; Calumet & Hecla Mining, closed 605, net gain 15; Green Cananea, closed 6, net gain ⅛; North Butte Mining, closed 42, net gain 6; Quincy Mining, closed 80, net gain 4.

New York.—Amalgamated Copper, closed 48¾, net loss ¼.

THE LEADING INDUSTRIAL SECURITIES.

	Clos'ng Quo Nov. 2	Changes in Week	Date 1907 Ann. M't'g	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	5¾	− ⅜	Sept. 5	19,820,000		.....	.....
Allis-Chalmers pr	16	+2		16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	3½	− ⅝	Feb. 7	41,233,300		.....	.....
Am. Can pr	36½	+ ½		41,233,300	7 cum	1¾ Q.	Oct., 1907
Am. Car and Fdy	25⅛	−1½	June 27	30,000,000		1 Q.	Oct., 1907
Am. Car and Fdy pr.	82¼	−1¾		30,000,000	7 n. c.	1¾ Q.	Oct., 1907
American Loc	37	− ¾	Oct. 5	25,000,000	5	1¼ Q.	Aug., 1907
American Loc. pr	84	.....		25,000,000	7 cum	1¾ Q.	Oct., 1907
American Ship	48⅛	−6¾	Oct. 2	7,600,000	4	3	Sept. 1907
American Ship pr	94	−5⅛		7,900,000	7 n. c.	1¾ Q.	Oct., 1907
Am. Steel Foundries	45⅛	− ⅝	Oct. 1	15,810,000		.....	.....
Am. Steel Foundries pr	20	−3		17,240,000	6 cum	2½	Aug., 1904
Barney & Smith	65	.....	June 4	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith pr	128½	.....		2,500,000	8 cum	2 Q.	Sept., 1907
Bethlehem Steel	8	−2½	April 2	14,862,000		.....	.....
Bethlehem Steel pr	28½	− ½		14,900,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	28½	+3¼	March 19	45,000,000*	6	1½ S. A.	Aug., 1907
Cambria Iron	42	−1		8,468,000*	4	2 S. A.	Apr., 1907
Chicago Pneumatic Tool	27¼	−3¼	Feb. 18	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	15½	+ ¾	Oct. 21	34,235,500		3½	Apr., 1903
Crucible Steel	6	.....	Oct. 16	24,578,400		.....	.....
Crucible Steel pr	55¾	.....		24,436,500	7 cum	1¾ Q.	Oct., 1907
Empire Steel	7	.....	Feb. 27	2,281,400		.....	.....
Empire Steel pr	50	.....		2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100	.....	Feb. 19	1,000,000	6	1½ Q.	July, 1907
Fay & Egan pr	128½	.....		1,000,000	7 cum	1¾ Q.	Aug., 1907
General Electric	107¾	+1	May 14	65,167,400	8	2 Q.	Aug., 1907
Harbison-Walker	14½	.....	Jan. 21	18,000,000		½	Oct., 1907
Harbison-Walker pr	69½	.....		9,600,000	6 cum	1½ Q.	Oct., 1907
International Pump	9¼	−1¾	June 4	17,787,300		1	Apr., 1905
International Pump pr	52¾	−7¾		13,835,000	6 cum	1½ Q.	Aug., 1907
Lackawanna Steel	34	.....	March 13	34,971,400		.....	.....
Lake Sup. Corp.	5½	.....	Oct. 2	40,000,000		.....	.....
New York Air Brake	62¼	−2¼	June 18	10,000,000	8	2 Q.	Oct., 1907
Niles-Bement-Pond	130	.....	Feb. 6	5,000,000	6	1½ Q.	Dec., 1907
Niles-Bement-Pond pr	105	.....		2,000,000	6 cum	1½ Q.	Aug., 1907
Otis Elevator Co	20	−2	March 18	6,375,500		1½ S. A	Oct., 1907
Otis Elevator Co. pr	74	.....		6,449,500	6 n. c.	1½ Q.	Oct., 1907
Penn. Steel	54	+4	May 13	10,750,000		.....	.....
Penn. Steel pr	90	.....		16,500,000	7 n. c.	3½ S. A.	May, 1907
Pittsburg Coal Co	8	.....	Feb. 11	28,297,600		.....	Nov., 1906
Pittsburg Coal pr	39	.....		27,246,800	7 c.	3½	Apr., 1905
Pressed Stl. Car	17⅜	−1⅛	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	70	.....		12,500,000	7 n. c.	1¾ Q.	Aug., 1907
Pullman	140	+1	Oct. 17	100,000,000	8	2 Q.	Aug., 1907
Railway Stl. Spring	25	+1½	March 7	13,500,000	4	2 S. A.	Oct., 1907
Railway Stl. Spring pr	76	.....		13,500,000	7 cum	1¾ Q.	Sept., 1907
Rep. Iron & Steel	13	−1½	Oct. 16	27,191,000		.....	.....
Rep. Iron & Steel pr	55	+1		20,416,900	7 cum	1¾ Q.	Oct., 1907
Sloss-Sheffield	31¾	+ ¼	March 5	10,000,000	5	1¼ Q.	July, 1907
Sloss-Sheffield pr	80	−3		6,700,000	7 n. c.	1¾ Q.	Oct., 1907
Tenn. Coal & Iron	134	.....	May 7	29,500,000	4	1 Q.	Aug., 1907
U. S. Pipe & Fdy	19	+1	June 26	12,500,000	4	1 Q.	Sept., 1907
U. S. Pipe & Fdy. pr	49½	−5½		12,500,000	7 n. c.	1¾ Q.	Sept., 1907
U. S. Steel	23¼	− ⅜	April 15	508,302,500	2 n. c.	½ Q.	Sept., 1907
U. S. Steel pr	83⅜	.....		360,281,100	7 cum	1¾ Q.	Aug., 1907
U. S. Steel 5's	84	−4½		463,796,000	5	5 A.	.....
Va. Iron, Coal & Coke	32	.....	Sept. 17	8,641,800		.....	.....
Westinghouse Elec	54	+5	July 24	24,998,700*	10	2½ Q.	Oct., 1907
Westinghouse Air Brake	133	.....	Oct. 1	11,000,000*		5 Q.	July, 1907

Par value of shares, $100, except those starred (*), $50.

FURNACE RELINING.

Harrisburg, Pa., Nov. 5.—It is the reported intention of several of the furnace companies in eastern Pennsylvania to immediately reline furnaces which have been blown out recently, and to make other repairs needed. It is stated that all five of the Lackawanna furnaces in the Lebanon district will be repaired at once. Four of these stacks were put out last week. One Warwick furnace at Pottstown is also to be repaired and so will Sheridan in a short time. The Pennsylvania Steel Co. furnaces at Steelton, Harrisburg and Lebanon are all working except one, No. 4, which was blown out last week for repairs, after a campaign extending over six years.

Work on the sheet mills to be erected at Hazelton has been started, the plant and machinery being removed from Pittsburg by the Schleiper Engineering Co. of that city.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Early Sun Stove Co., Newark, O., has been formed by G. A. Wise, L. Dean, W. W. Maholm and C. W. McAdams, with a capital of $5,000.

The Norton Car & Foundry Co., Norton, Va., has been chartered with a capital stock of $25,000. The officers are: Rudolph Swank, president, and J. R. McNutt, secretary-treasurer.

The Monarch Iron Works, Brooklyn, iron work, capital $15,000, has been formed by Otto Guttman, 230 Cooper street; Gottlieb G. Hess and Elise Hess, 814 Lincoln place, all of Brooklyn.

The Vulcan Iron & Steel Works, Milwaukee, Wis., has filed articles of incorporation with a capital of $35,000. Those interested are: Christ Stein, John E. Reilly and Angus J. Koegler.

The F. G. Gauntt Mfg. Co., Ft. Wayne, Ind., capital $25,000, has been chartered to manufacture machinery and engines. The directors are: Forest G. Gauntt, James D. Lewis, and Philip F. Dixon.

The Oklahoma City Steel & Iron Works, Oklahoma City, Okla., has been incorporated with a capital of $10,000 by H. M. Little, 1106 West Main street, Oklahoma City; H. F. Mitchell and Lewis Althoff, both of Kansas City.

Articles of incorporation have been filed by the Burger Foundry Co., Akron, O., with a capital of $25,000. The incorporators are: Joseph A. Burger, Joseph G. Bachman, C. Brenner, M. M. Kindig and Harry Mitchell.

With a capital of $25,000 the Cast Iron Brazing, Die & Tool Co., the Temple, Chicago, has been organized by Grant Newell, John W. Britton and Edward Everett to manufacture in metals. The company is capitalized at $25,000.

Robert S. Redfield & Co., New York, machinery, have been incorporated with a capital of $35,000. The directors are: Robert S. Redfield and Robert P. Bennett, 26 Cortlandt street, New York; William N. Redfield, Seattle, Wash.

Charles A. Carlson, Otto Rabe and Peter N. Kohlsatt have organized the Independent Carbonating Machinery & Mfg. Co., 504 La Salle street, Chicago, with a capital of $20,000. The new company will manufacture carbonating machinery.

Henry F. Gray, F. E. Stevens, E. G. Savage, W. R. Calkins and F. C. Hubbard have organized the Standard Appliance Co., Columbus, O., with a capital of $100,000. The company will manufacture and sell gas and water meters and supplies.

The Screw Machine Specialty Co., 100 Washington street, Chicago, has been chartered to manufacture tools, machinery, etc. The capital stock of the company is $2,500, and the incorporators are: Albert Christiansen, James J. Leahy and K. Neale.

The Contractors' & Builders' Supply Co., Somerville, Mass., machinery, tools, etc., has been formed with a capital of $30,000. The officers of the company are: President Charles A. Landers, Somerville; treasurer and clerk, Frederick F. Haskell, Cambridge.

The Selma Iron Works, Selma, N. C., has been chartered to operate machine and repair shops, foundry and other departments. The capital stock of the company is $50,000, and the incorporators are: N. E. Edgeton, J. R. Lewis, W. H. Call and S. C. Robertson.

The Berkshire Electric Co., Pittsfield, Mass., electrical and mechanical apparatus, has been chartered with a capital of $10,000. The officers of the company are: President, Clarence H. Hopkins; treasurer, Arthur E. Truesdell; clerk, George E. French, all of Pittsfield.

The Emanuel Steel Tank Co., Kalamazoo, Mich., has been incorporated with $60,000 capital by Carl H. Zwerinan, Kalamazoo; James Laughead, Kalamazoo; Charles Miller and Horace Hubbard, Sturgis, Mich. The company will manufacture enameled steel tanks.

With a capital of $3,000, the Van Curan-Bengel Co., Rochester, N. Y., has been incorporated to manufacture hardware, tools, plumbing goods, etc. Those interested are: Christopher J. Van Curan, Edna L. Van Curan, Rochester, N. Y.; Henry C. Bengel and Georgia E. Bengel, Brighton, N. Y.

Alexander V. Fraser, 628 Flatbush avenue; William Oglivie, 459 Pacific street, both of Brooklyn, and Walter Lester Glenney, Plainfield. N. J., have organized the Russel Fraser Wire Co., Brooklyn, N. Y., with a capital of $60,000. The company will manufacture wire and wire goods.

Articles of incorporation have been filed by the Morrow Mfg. Co., Elmira, N. Y., with a capital of $23,000, to manufacture machine tools, machine parts, automobile parts, etc. The incorporators are: Alexander P. Morrow, J. Edwin Morrow and S. C. Morrow, all of the address given above.

The Douglas Electric Construction Co., New Orleans, La., has been organized to manufacture and deal in electric appliances and apparatus, with a capital of $25,000. The officers of the company are: Roydan R. Douglas, president; Edwin O. Cook, vice president, and David Ettinger, secretary-treasurer.

The Tri-State Coal, Coke & Improvement Co., Latrobe, Pa., with a capital of $250,000, has been organized to acquire coal and coke mines, and to generally deal in coke, coal, iron, steel, etc. The incorporators are: E. J. O'Brien, Latrobe; George A. Drovin, Philadelphia; Ray Wind, Camden, N. J., and E. R. Cochran, Wilmington, Del.

The Gilmore Coke Co. and the Gilmore Coal & Coke Co., Uniontown, Pa., have been organized with capitals of $5,000 each to develop coal lands near Smithfield, Pa. Those interested in the company are: Mary P. Gilmore, Guy B. Gilmore and Samuel A. Gilmore, executors of the late John A. Gilmore, of Uniontown; Richard W. Austin, Theodore D. Bliss, A. P. Austin, Henry P. Gilmore and others.

New Construction:—

The Carpenter Steel Co., Reading, Pa., is erecting a new inspection building, 55 x 128 feet, one story.

The Canton Boiler & Engineering Co., Canton, O., has completed the erection of an addition 50 x 150 feet to its plant.

The American Steel Package Co., Defiance, O., is planning the erection of a one-story brick building, 73 x 277 feet, to replace the portion of its plant recently damaged by fire.

The Springfield Elevator & Pump Co., Springfield, Mass., has awarded to the Flynt Construction Co., Palmer, Mass., the contract for the erection of a one-story brick factory, 80 x 225 feet.

The American Steel & Wire Co. is building a brick and steel engine house, 130 x 130 feet, at its Central furnaces, Cleveland, in which equipment will be installed for using the waste gases from the furnaces for power purposes.

Kyle & Dugan, of Columbus, O., have completed the plans and will furnish the necessary material for the reinforced concrete buildings of the plant of the East Iron & Foundry

Co., Lima, O. The main building will be 100 x 160 feet.

The La Salle Machine & Tool Co., La Salle, Ill., which recently increased its capital stock, is materially increasing its capacity by the construction of new buildings. These are expected to be ready for operations by the first of the year.

John J. Bruce Foundry Co., Cincinnati, has commissioned an architect to prepare plans for an office and pattern building to be built on Colerain avenue, in that city. The structure will be two stories, 50 x 100 feet. The company recently awarded contracts for the erection of a new foundry building.

Charles H. Birmingham, 231 South Exeter street, Baltimore, Md., brass foundryman, who recently purchased a site for a new plant, reports that plans are now in the hands of a contractor and that the details have not yet been completed. The new plant, however, will be run by turbine and electrical power.

The Philadelphia architectural firm of Hewitt, Stevens & Paiste has asked for estimates on a warehouse for the Union Drawn Steel Co. of that city. This will be a two and three-story brick structure, about 100 x 130 feet, and will cost about $40,000. It will be located at the corner of Ninth and Willow strets, Philadelphia.

The plant and property of the Diamond Iron Works, Muskegon, Mich., has been purchased by the Prins Foundry & Mfg. Co. New buildings will be erected in the spring, but at present the new owners are remodeling the building and putting it in shape for a large business which the company expects to enjoy during the coming year.

The Raymond Lead Co., 51-59 West Lake street, Chicago, is about to begin the erection of a plant in that city, consisting of a two-story main building 125 x 175 feet, to contain a sheet lead mill and a power house; a storage building, 18 x 139 feet; offices and lead presses, 113 x 224 feet, to be partly of steel and partly of mill construction. The plant will be ready next spring.

The Canton Brass Co., Canton, O., has just completed a new foundry, of brick construction, 50 x 160 feet; a coke and metal building, 40 x 60 feet, and a pattern storage building, 18 x 26 feet, which will provide a capacity triple its present output of brass specialties and castings. A duplicate of its foundry building to be used as an extension to its machine shop will probably be erected later.

Joseph T. Ryerson & Son, 18 Milwaukee avenue, Chicago, are preparing to award the contracts soon for the superstructures of a warehouse and office building to be built at Sixteenth and Rockwell streets. The warehouse will be one story, 144 x 238 feet, with an L extension 101 x 267 feet, and the office building three story, 40 x 227 feet. The buildings will be of brick, steel and concrete construction.

The Holland Funace Co., Holland, Mich., manufacturer of heating furnaces, is erecting an addition to its plant in the form of an L-shaped building 80 x 218 x 100 x 50 feet, which is expected to be completed about the first of the year. The building will be used as a warehouse and will also afford space for the sheet metal department. The company will not be in the market for any new machinery before the first of the year.

The Eagle Casting Co., Winchester, Ky., has begun the construction of a new foundry plant, consisting of a main building 60 x 120 feet, pattern shop, pattern storage and other structures. The foundry will be equipped with two cupolas with a combined capacity of about 25 tons daily, an electric traveling crane, automatic chippers and sand blast cleaners. The foundry will start with considerable business under contract for the ensuing year.

The United Gas Improvement Co., Philadelphia, has purchased a considerable tract of ground on Chestnut street near Forty-seventh and will erect a holding tank of 3,000,000 cubic feet capacity. Another tank of similar size is to be built at Aramingo and G streets and a distributing house and stables will be provided on another plot recently purchased on Forty-seventh between Market and Ludlow.

General Industrial Notes:—

The Turner Brass Works, Sycamore, Ill., has increased its capital stock from $150,000 to $168,000.

The Minster Machine Co., Minster, O., has increased its capital stock from $40,000 to $80,000.

The Ohio Foundry Co., Dayton, O., has filed an increase of capitalization from $25,000 to $125,000.

The American Automatic Switch Co., Salisbury, N. C., recently organized, is not contemplating the erection of a plant at the present time.

The Warwicke-Webb Machine Co., Dallas, Tex., has filed an amendment to its charter changing its corporate name to the Warwicke Foundry & Machine Co., and increasing its capital stock from $25,000 to $50,000.

The Midgley Mfg. Co., Columbus, O., is putting the finishing touches upon the large addition being erected to its plant in that city. The extension will increase the capacity of the plant about three times. Machinery is now being installed.

The Hamburg Mfg. Co., Hamburg, Pa., recently organized, will manufacture quick service chain hoists. The company has purchased a two story building, 60 x 96 feet, and has a plant arranged with a capacity of at least 25 chain hoists per day. W. J. Schmick is manager.

The Engle Mfg. Co., Peoria, Ill., manufacturer of wagon dumps and seeders, has been reorganized by the election of Martin Sehm as president, Robert Herschel, vice president, and Paul E. Herschel, secretary and treasurer. The reorganization is expected to greatly strengthen the position of the company.

The Cement Engineering & Construction Co., 225 Fifth avenue, New York, is in the market for machine tools, steam shovels, tramway equipment, steel building, shafting, pulleys, etc., and a large amount of iron bin work for the new cement plant it is building for the Seaboard Portland Cement Co., Alsen, N. Y.

The Detroit Stove Works, Detroit, Mich., has filed a certificate of increase of capital stock to $3,500,000, of which $2,000,000 is common and $1,500,000 is 6 per cent cumulative preferred. The company owns stove manufacturing plants in Detroit and warehouses in Chicago. W. T. Barbour is president, and G. B. Gunderson, secretary and treasurer.

The Phoenix Mfg. Co., Eau Claire, Wis., machinery, has completed extensive additions to its plant, consisting of a building 96 x 220 feet. The taking possession by the company of the new building was the occasion of impressive ceremonies in which a banquet and other social festivities figured. The machinery is now being installed.

Sayre Bros., Phoebus, Va., recently incorporated, state that they are merely a continuation of the firm of Sayre Bros., which have been operating for three or four years. The company is doing general foundry business, largely machine and structural iron work, with a capacity of from 15,000 to 20,000 pounds daily. No material changes or additions are contemplated at present.

The Youngstown Bronze & Iron Foundry Co., Youngstown, O., advises

that it has no intention of making any improvements to its plant at the present time. The report that such were the company's plans, it is stated, originated from the fact that the company recently sold a portion of its unused ground to the Lake Erie & Eastern railroad, but this will not interfere, for the present at least, with the operation of the plant.

The Ralston Steel Car Co., Columbus, O., has discontinued the night force in its plant in East Columbus. Officials of the company say that this action is not taken by reason of any falling off of orders, but that owing to the completion of adidtional shops, practically the same amount of work can be turned out now in the day time that was formerly turned out by the two shifts. The change lays off about 100 men. The night shifts were put on when the company accepted rush orders for cars for the Hocking Valley, Ohio Central and other allied lines.

The Newton Engineering Co., Hathaway building, Milwaukee, reports that the recent increase in its capital stock was made to facilitate the handling of a large contract just taken in by it for the construction of the Grand avenue viaduct adjacent to Milwaukee. The viaduct is to be built of reinforced concrete according to the Melan system, the value of the award being $372,000. The designing engineer is the Concrete Steel Engineering Co., New York. The Newton company at the present time is in the market for materials and the necessary machinery for handling the work.

The Eagle Foundry & Machine Co., Fort Scott, Kas., has undergone a reorganization, resulting in Robert G. Long, of the Missouri Pacific Railway Co.'s shops, becoming its president and general superintendent. Mr. Long has severed his connection with the railway company. C. C. Crain, formerly president of the Eagle company, has retired from that position to become vice president, and J. H. Mead, who has been actively connected with the management of the plant, has also retired, but both he and Mr. Crain have retained their interests in the foundry. Lloyd Lakin has been installed as secretary and treasurer. The new board of directors consists of C. C. Crain, C. C. Nelson, J. H. Crain, J. T. Beatty, C. A. Lakin, J. H. Mead, R. G. Long, J. H. Prichard and L. C. Lakin.

Trade Notes:—

The Pittsburg Automatic Vise & Tool Co., has under way a shipment of "Pittsburg" vises amounting to $5,000, consigned to one of the largest manufacturing plants in England. The company reports a very extensive volume of export business.

The Ball Engine Co., Erie, Pa., has opened a sales office at 1001 Arcade building, Philadelphia, under the management of H. P. Penfield, for the sales of its automatic and Corliss engines in order to better handle the growing demand for these types of engines.

Among the notable orders for Allen riveting machines, recently reported by John F. Allen, 370-372 Gerard avenue, New York, is one for a stack riveter that will reach 84 inches into a stack 8 inches in diameter, and drive 1 inch hot rivets or ½ inch cold rivets. The riveter, which is of unusual size and capacity, is going to the Hawley Down Draft Furnace Co., Chicago.

Fires:—

The Kinsey Mfg. Co., Dayton, O., was damaged by fire to the extent of $15,000 Oct. 29.

The plant of the Carson Trench Machine Co., Charleston, Mass., sustained a small loss by fire Oct. 29.

The Strothman Iron Co., Superior, Wis., was damaged to the extent of about $10,000 by fire in its plant Oct. 26.

The machine shops of the Fourche River Lumber Co., Fourche, Ark., were damaged by fire Oct. 21. Insurance is ample.

Iowa Central railway shops, Marshalltown, Ia., sustained a heavy fire loss Oct. 26, estimated at about $100,000.

Fire in the pipe shed of the General Pipe & Foundry Co., Albany, N. Y., Oct. 24, caused a loss estimated at $2,000.

The plant of the South Atlantic Car & Mfg. Co., Waycross, Ga., was heavily damaged by fire which originated in one of its foundries Oct. 23. The loss is estimated at upwards of $200,000, with $250,000 insurance.

A disastrous fire visited the rake and harrow factory of Patten & Stafford, Canastota, N. Y., recently. The main building and other structures sustained a large loss which is estimated at about $25,000.

Supt. C. D. McLaughlin, of the Ironton Engine Co. plant, reports the plant busy with orders and prospects good for a steady run. At present the company is completing a 500-horsepower engine for an electrical plant at Springfield, Ind., and one of 200 horsepower for the Middle Creek Coal Co., of Prestonburg, Ky.

TRADE PUBLICATIONS.

Rheostats.—The General Electric Co., Schenectady, in bulletin 4532 shows some recently perfected lines of direct-current motor-starting rheostats in capacities up to 50 horsepower and 550 volts. Types SA and SO rheostats are described.

Induction Motors.—The Barriett Electric Mfg. Co., Cincinnati, in bulletin 106 illustrates and describes the polyphase type N induction motor, together with various parts. These motors are made in all sizes from ½-horsepower to 60-horsepower for two or three-phase circuits and are supplied for all standard voltages.

Shovels.—The Conneaut Shovel Co., Conneaut, O. 8 pages. 6 x 9 inches. This catalog illustrates and describes the various types of shovels manufactured by this company, including the Ronberg ore shovel, the Magyar union coal shovel, the Millola patent track shovel, the scientific round point shovel, the Hudson river cutting spade, the Martin brand spade, etc.

Feed Water Heaters.—The Harrison Safety Boiler Works, Philadelphia. 12 pages. 6 x 9 inches. This catalog describes the Cochrane feed water heater, and shows the superior economy of steam-driven, as compared with electrically or mechanically-driven auxiliaries, with illustrations covering the engineering phases of the subject.

Forgings.—The Anderson Forge & Machine Co., Detroit. Catalog. 23 pages. 3¾ x 8½ inches. Contains illustrations and descriptions of the various kinds of forgings manufactured by this company, including drop forgings, steam hammer forgings, crankshaft forgings, tool steel forgings, etc. There is also a special insert in the catalog illustrating 2-throw and 4-throw crankshafts, which were made in excess of requirements on a large order for shafts.

Cars for Smelters and Power Plants.—The Cleveland Car Co., West Park, O. Serial catalog. 10 pages. 6 x 9 inches. Illustrates and describes industrial and narrow gage railway equipment, covering service conditions for all classes of manufacture. The first pages of the catalog detail the system of drawings and records employed by this company to replace broken parts, the promptness of its service in filling orders, and give specification requirements for cars, tracks, switches, etc. The various types of cars and tracks built by the company are illustrated and described, together with some of their parts.